SonicProjects

OP-X PRO-II

SYNTH INTERFACE 1.3 MANUAL

www.sonicprojects.ch

Introduction

Welcome to the SonicProjects OP-X PRO-II version 1.3.0 manual!

OP-X PRO-II version 1.2 is the new cross-platform version of OP-X PRO-II featuring AU / VST2 / VST3 64bit support. Its features remain the same except for some changes in the patch system and in the MIDI engine (see page 4).

The technical structure of the OP-X PRO-II engine is quite unique. It's based on 12 completely independent single voices which correspond to the voice boards of real analog polyphonic synths. There's no digital voice cloning as it's usually the case in vst instruments. Each single voice in fact is an independent monosynth, each voice has its own signal path and each voice differs very slightly in its sound by default, as it was the case in real analog synths too, caused by device tolerances. This unintended imperfectness was one of the main reasons for the organic and lively sound of the old originals.

Although detuned voices are great for some sounds (especially pads), they're not so great for others (brass, fm, ...) which sound better with evenly tuned voices. Some sounds profitate from just a slight bit of detuning. The voice boards of real voltage controlled analog synths offered tuning trimpots which had to be tuned by a service technician to make the voices sound even, and advanced synths furthermore offered an autotune button which calibrated the voices. But there was no further control over detunings, no way to play and experiment with them. OP-X PRO-II however offers total control over these. On one hand it offers virtual trimpots which represent the trimpots of the voicecards in real synths, which allow to edit the voices' detunings in every tiny detail if needed. On the other hand it offers four global auto-tune buttons, which allow to switch or also seamlessly blend between detuned and tuned state globally in a very fast and intuitive way, separately for oscillators, filters, envelopes and portamento times. All of this is savable per patch and gives you tremendous control over the general character of the whole system before you even start to edit the usual synth parameters. This allows the synth to copy the root characters of many different synths which apart from the filter often mainly differed in their stability and so amount of detunings.

We call this concept Separate Voice Design (SVD).

A welcome side effect of the separate voice design is the presence of stereo pan controls for each voice channel. This popular feature of old analog synths allows for mind-blowing real stereo without the need of diluting chorus effects.

A further thought went to the design of the filter. It's inspired by the famous SEM filter, but offers a bunch of extensions which makes it way more flexible and capable of delivering a wide range of different sound characters. It's a parallel lp / multimode filter design offering seamless filter mix and continuous blending from high pass to band pass to notch, a switchable 24db mode and switchable self oscillation. The filter mix can be modulated by lfo and envelope. Furthermore there are four brightness modes which determine the maximum pass frequency and the behaviour at the top border.

Installation

Mac:
NOTE: The minimum supported system is macOS 10.13 High Sierra.
Native M1 support (universal M1 and Intel).

 OP-X PRO-II 1.3.0 Installer

Double-click the installer to install. Gatekeeper shouldn't block it since the installer is notarized. Don't change the install location. Restart afterwards.

If Gatekeeper nevertheless should block the installer then right-click / ctrl + click the installer and choose „Open" from the context menu:
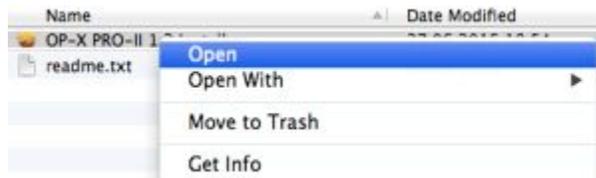
In the upcoming warning window then once more confirm by clicking „Open":

Now the installer will launch and take you through the steps. We recommend to install all items. The items will be installed to these places:

AU plugin:
/Library/Audio/Plug-Ins/Components

VST3 plugin:
/Library/Audio/Plug-Ins/VST3

Presetbase:
/Users/Shared/SonicProjects/OP-X PRO-II/Presetbase

These locations are required in order your sequencers can see the plugins and the synth can see the banks and other needed files.

IMPORTANT: Restart the system after installation.

By re-installing the Presetbase over an existing one installed before eventual own created custom presets and banks will remain.

Uninstallation:
Simply again delete the installed items.

Windows:
NOTE: This version 1.3 requires a 64bit VST3 host and Windows 10 or 11

OP-X PRO-II 1.3.0 Installer
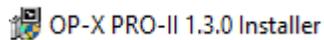
Note that this version only comes in VST3 format.

Doubleclick the installer and follow the steps. If Windows SmartScreen blocks the installer then click on „More info" and then on „Run anyway". If there's a warning window after installation saying „This program may not have installed correctly" then choose „This program installed correctly".

The VST3 installation path can't be changed since VST3 plugins need to be in a fixed place in order sequencers can see them, which is:
C:\Program Files\Common Files\VST3

The presetbase will be installed to this location:
C:\Users\Public\Documents\SonicProjects\OP-X PRO-II\Presetbase

This location is required as well in order the synth can see the banks. By re-installing the Presetbase over an existing one installed before eventual own created custom presets and banks will remain.

Uninstallation:
To cleanly uninstall simply delete the installed items. There are no registry keys written.

What's new in version 1.3.0 - Coming from version 1.2.6

Mac:
Native M1 silicon support and the newest AU and VST3 versions

NOTE that this new AU version breaks compatibility to former sessions. To transfer an existing session save the recalled patch of the used instances - still with the older 1.2.6 version installed - as single opxpreset presets by clicking the PRESET SAVE button. Add the track number to the save name so that you know which saved preset belongs to which instance. Then install version 1.3 and again load the session. The used instances load using the new 1.3. version but re-set to the default sound. Now open each used instance and load the before saved correct single presets using PRESET LOAD for each instance and then re-save the session, the best with a new name to still have the old on demand since the new won't be compatible to version 1.2.6 then.

Windows:
VST3 only but the newest version which fixes the GUI issue in Ableton Live

Both Windows and Mac:

- Switchable GUIs without re-installation (windows icon in the top left corner)
- Switchable velocoty to AMP (volume) by clicking the VEL button twice to blue
- Unwantedly hanging (held) arpeggios stop upon song stop

What's new - Coming from OP-X PRO

This „what's new" section is dedicated to former OP-X PRO users who want to gain a brief overview on what's all new compared to the standard OP-X PRO. You may read the dedicated sections in the manual to learn all details related to the brief listings here (which still is 4 full pages). For better overview the different changements are grouped into individual sections:

Popyphony and voice allocation:

The polyphony has been doubled to 12 voices by adding a second bank of 6 voices. The new lower bank shares the tuning trimpots, pan controls and mute buttons with the upper bank. That's why we speak of 6 voice channels, each for 2 voices. Polyphony can be switched between 6, 8 and 12 voices with the blue square button next to „6" on the right side of the levers. For the 8 and 12 voice mode the lower bank is involved too. In the eight voice setting the middle two voices of the lower bank are involved to avoid sound repetitions since the corresponding channel voices share their fine tunings.

The voice muting section now not only mutes the voices, but also completely deactivates them. The voice allocation engine will distribute the voices only between the active voices then, and this still always in rotating mode. This allows for any custom polphony setting with any voices of choice involved, with the resulting total cpu usage dropping if fewer voices are involved. The only limitation is that the two voices of the same channel only can be deactivated both at the same time.

Patch Browser:

A new patch bowser allows for host-independent loading, saving, renaming and browsing of presets and banks, which are loaded and saved to a fixed central location. This makes the creation of own custom banks fast and easy. The increment/decrement buttons access the patch change smoother for artefact free preset change, and the list can be temporary up (left down arrow) or locked (right down arrow). 1.2 uses a new host-independent file format.

MIDI Learn:

A MIDI Learn engine now allows for easy learning of external controllers to the synth's controls, just by tweaking the controller and the GUI control that should be learned to it. In OP-X PRO-II version 1.2 there's no implemented standard mapping anymore to avoid unwanted parameter changes by eventual incoming controller messages. In 1.2 the filter tuning trimpots now can be mapped too.

MIDI CC Processor:

A new MIDI CC processor allows for relative (REL) and fetched (FET) response to incoming MIDI CC data to get rid of parameter value jumps. Since MIDI feedback isn't supported anymore in OP-X PRO-II version 1.2 (because there's no MIDI output) this comes in handy to compensate it.

Effects Unit:

There's an integradted effects unit included now, which offers a great sounding reverb and a mono delay (0 - 1000 ms) with normal, triolic (triples) and dotted synchronization option to both song tempo and arpeggiator. Sync switches to arpeggiator automativcally when it's on. Apart from manual editing the unit offers a bunch of built in presets (click on the small down-arrow between the delay and reverb parameter controls) that can initialize a suitable complex setting with a single mouseclick for various applications. The effects unit can be switched to dual engine mode on demand (with PP ON) so that the effects of the previous preset can finish unchanged into the new preset after preset change while the new setting can be used immediatly by the new preset.

LFO: New waveforms, manual trigger, delay and sampled vibrato

Two new waveforms, triangle and sawtooth, can be switched by different combinations of the three wave buttons. The mixed waveforms sine & square and square & s/h are still available. The rising sawtooth wave can be changed to falling sawtooth by inverting it in the „Lfo Phase" section. S/H now can be turned into sampled vibrato by clicking on AMP two times (LED blue). In this mode the S/H input is fed by the lever LFO instead of noise, which leads to repeated patterns. The LFO now can be triggered by played notes on demand by clicking on „Lfo Phase: OSC" two times (blue mode). The starting phase can be freely adjusted with the beat trimpot just above „CONTROL". The LFO furthermore can be delayed and faded in triggered by notes by clicking two times on „Lfo Phase: PW-FILT". A third click will additionally invert LFO to PW-FILT as in normal (orange) mode. The delay time can be regulated with the „Velo/Mode" knob located on the right side of the voice mute buttons, the fading in time with the „Stp/Speed" knob next to it. The fading in will start only after the delay.

Seamless control of detunings, oscillator and noise levels

The detunings (OSC/FILT/ENV/Porta DET) and the main oscillator and noise levels (OSC1 on, OSC2 full, NOISE full) now can be continuously controlled on demand by clicking into the dedicated text labels just above the buttons and dragging the mouse vertically up or down. Small popping up digital displays will show the current value ranging from 0 - 127. These fine adjusted values always will stay active in the background and can be saved with the patch. The buttons' LED only changes its state when 50% is surpassed, so they just can indicate if the fine adjusted value is in the lower (dark) or higher (shinig) half. Clicking on the buttons as usual will reset the values to either 0 or 127. So the buttons still can be used as you're used to, with the option to fine adjust the value if needed. Deactivate the „HALF" buttons to use full range of continuous control since those still are only on/off and add their level to the sum value.

Wheel LFO: also exchanges pan mod LFOs

Apart from the wheel LFO this button now also exchanges the pan mod LFOs, so that the wheel LFO instead of the main one modulates the panning.

One-click calibration of trimpots, pan controls, master tune and envmod

The voice-based tuning trimpots (FILT, DEC/REL, POR), the filter trimpots, the pan knobs, master tune and envmod controls now can be calibrated by simple mouseclicks on pre-defined areas next to the controls. Filter trimpots: click into the small blue area between the white line of the box and the black metal background on the right to calibrate the trimpots to equally tuned, and click into the corresponding area on the left side of the trimpots block to return to the standard detuning (all trimpots 12 o'clock again). DEC: Click on „C" to tune the trimpots, and on „D" to return to the stadard detuning. REL: Click on „L" to tune the trimpots, and on „R" to return to the stadard detuning. POR: Click on „R" to tune the trimpots, and on „P" to return to the stadard detuning. Filter section: Click on „OSC2" to reset all trimpots to 0 for pure low pass mode. Voice pans: Click on „Voice" to set all pans to mono, click on „Pans" and drag the mouse vertically up or down to spread the pans countinuously, click on 1, 2, 3, 4, 5, or 6 to access various pre-configured pan setting presets. Master tune: Click on „Tune" to center it. OM/PM: Click on „OM" and „PM" to set them to 0.

Freely choosable pitch lever interval and further modes

Click into the number above the blue square button and drag the mouse vertically up or down to access all intervals from 1 to 12 semitones and a lot of further modes featuring different upbend/downbend intervals and different functions for the modwheel (to filter, to pitch). Have a look at the table on page 69 (LEVERS: 2/12) to get to know all modes in detail. The square button still lets you switch between the two mostly common modes (2 and 12 semitones). Also new and improved: Pitch bend data from older masterkeyboards that only has a range of 0 - 127, and so has no exact center position, is processed in that way that it nevertheless produces an exact interval. For this the center point has been slightly shiftet, which may ask for re-calibration of some older patches that have a sensible setting (osc2 only and 12 semitones). For this just move the lever, let it jump back and save the patch.

DMP: Two new bright modes available

The DMP button, formerly just used to reduce the general cutoff level by a fixed amount for key tracking, now can access two further modes, which are two „bright" modes, that are inspired by the brightness behaviour of very early voltage controlled poly synths like OB-X, which could be very bright, and sometimes even a bit harsh. The former DMP mode of course is still available (LED orange/DMP). The blue (CLR) and red (BRL) mode are the two new bright modes. CLR/blue: The filter opens up fully in maximum cutoff setting which lets pass the oscillator signal uninfluenced (in normal mode it's always tamed a bit when it passes the filter, even with cutoff set to max, like in e.g. Minimoog), which leads to a brighter tone, also if the filter cutoff is driven by modulation sources (envelope, LFO). BRL/red: Similar, but the top end additionally receives some extra edge and brightness, which may be near to harsh, very close the e.g. discrete OB-X. These two modes may be useful when you try to copy a sound that needs this extra brightness to be authentic. But in most cases the standard (NOR) mode will still be the most pleasing, fat sounding and well balanced one, as you will notice by yourself.

ENV: Two modes now, including linear amp env attack

Some sounds, especially juicy legato strings with very slow attack, can be too impulsive with logarithmic attack, and work better with a linear attack segment, which can be activated with the new second function if the ENV button: LIN (LED blue): The attack segment of the amplifier envelope is switched to linear. It's recommended to activate „Lega ON" in this mode which now also has an effect in polyphonic mode and forces the envelopes to start at 0.

Filter: Switchable self oscillation

Two clicks on „24db" activates filter self oscillation, indicated by a small lamp.

Triangle waves for oscillators

If both oscillators are switched to sine waves, the sine waves can be tunred into triangle waves by increasing the pulse width knob to maximum.

LFO rate / Pitch1: wider ranges

LFO rate can be slower (very slow) now, and pitch 1 has 5 octaves now.

Filter ADSR: now invertable

The filter envelope now can be inverted (like in Jupiter 8) on demand by clicking two times on the right one „\" of the „Filterenv Modulation" buttons group, which sets the LED to blue mode. Inverted pw-envmod can't be accessed then, but is rarely used anyway and also can be achieved with a different default pulse width setting.

A new arpeggiator/MIDI processor

The new OP-X PRO features a very sophisticated new arpeggiator/MIDI processor that is controlled with only the same controls as before plus additionally with the two velocity knobs on the left. It offers 32 modes that can be accessed and changed on the fly by turning the „Arpeg Mode" knob. The modes include all kinds of arpeggios, up/down/combined, 1-4 octaves, notes sorted by input order (Order) or note pitch (Pitch), and some randomized. The modes also include 3 different stepped modes (known from former OP-X) with 2 different repeated modes. Apart from the arpeggios there's a record mode (record up to 8 notes, play them back, edit on the fly), a manual chord hold mode (volatile), a preset chord mode with 16 chord presets (choosable with „Chrd"), and a double mode that outputs two notes on one key for very fat slightly detuned notes (use SPREAD and pans!). The preset chords and doubled notes can be arpeggiated as well by clicking a second time on „ARP ON". The arpeggiator controls then are the two knobs on the left side. Apart from using the „ARP On/Hold" and „Hold VEL" (for double/chord arpeggios) button hold and playback for record can by activated and deactivated with the damper pedal by quickly depressing and releasing it again within less than half a second. This is very practical if both hands are busy with playing, and it still allows to sustain notes by depressing it in a normal way.

The TOP BAR

The grey top bar probably is the most striking new controls section compared to the former OP-X PRO. It combines these 4 four function areas:

1. Patch browser
2. Effects section
3. MIDI CC processing engine   4. New in 1.3: Interface switcher

Interface switcher

Click on the windows icon at the top left, choose the preferred interface, and then close and re-open the interface.

Patch Browser

This section lets you browse, choose, rename, load and save presets and banks in a very quick and easy way without the need to reach the vst host for this task. It lets you easily explore the included banks library and create own new custom banks using existing or your own presets.

The synth in its current 1.2 cross-platform and 64bit version now uses a new proprietary host-independent patch format (.opxpreset and .opxbank). So you can use the same presets in all hosts and systems. The library location in Mac is /Users/Shared/SonicProjects/OP-X PRO-II/Presetbase and in Windows C:\Users\Public\Documents\SonicProjects\OP-X PRO-II\Presetbase. The patch browser's buttons to load and save banks or single presets always should point to these places by default.

Banks (mac/win):
/Users/Shared/SonicProjects/OP-X PRO-II/Presetbase/Banks
C:\Users\Public\Documents\SonicProjects\OP-X PRO-II\Presetbase\Banks

Single Presets (mac/win):
/Users/Shared/SonicProjects/OP-X PRO-II/Presetbase/Presets
C:\Users\Public\Documents\SonicProjects\OP-X PRO-II\Presetbase\Presets

In some occasions the buttons may not point to the correct locations by default initially, e.g. pointing to the place of the last saved song instead. In this case click all 4 load/save (preset/bank) buttons once or twice to re-set the location. You're free to create any custom sub-folder structure within these places.

After the theory let's now come to the practical application. Let's have a look at the single elements of the browser and what they do:

Name field:

The name field on the left on one hand shows the name of the chosen preset within the loaded bank and on the other hand lets you rename the preset if you want to create a new preset. For this click into the field and type in the new name. If necessary confirm with „enter" or by clicking somewhere outside.

In vst hosts with „always on top" active it may be necessary to temporary deactivate this state if any keyboard letters are mappeed to sequencer functions (shortcuts).

The new name of course only will be persistent when you save the bank (to a new one when it's a preset bank) or the single preset.

Down arrows:

These two arrows will launch a scrollable white on black preset list in the left area of the GUI. These are the presets of the loaded bank (128). This allows to have a quick overview on what's available in this bank.

You of course can directly choose presets from the list. But be aware that the patch change smoothing engine (see dedicated sections) will not be active using this way of choosing presets. For completely smooth and artefact free operation (e.g. in live events) use the increment/decrement buttons or MIDI program change instead, which both feature smoothing.

But why are there two arrows?

Left down-arrow:
When the preset list is launched with this arrow, it will disappear again after choosing a preset, which is convenient for quick patch selection when you already know where the preset is located.

Right down-arrow:
When the preset list is launched with this arrow, it will remain permanently on top, even when you choose a preset, until the arrow is clicked on a second time. This can be useful to browse around a bit to see what's there. You also can lock the list afterwards with this arrow if it was launched with the left one.

Number field:

This field indicates the ordinal number of the chosen preset within a bank, going from 1 to 128. If using MIDI Controllers to initiate a program change (see page 85 ff) the correlating CC numbers will be 0 - 127 instead.

Increment / decrement arrows:

With these buttons you can switch presets forward or backward. Using this method of preset change smooths the crossings with the patch change smoother by quickly fading out the previous preset, releasing all notes and quickly fading in again the new one, for smooth and artefact free changes, which can be important in critical live application. Note that the same type of smoothing is also performed using external program changes via MIDI CC. New: The increment/decrement buttons can be learned! See page 86 ff.

Load Bank:

Clicking on the „LOAD" button below „BANK" will open the file browser to choose and load a bank. The default loading location always is the same, in Mac /Users/Shared/SonicProjects/OP-X PRO-II/Presetbase/Banks, in windows C:\Users\Public\Documents\SonicProjects\OP-X PRO-II\Presetbase\Banks. The load bank button automatically should point to this location by default. If not then simply click all load and save (preset/bank) buttons once or twice which should re-set the buttons to the default path. To load a bank you either can choose „open" after having chosen a bank or just doubleclick it. Apart from the root selection there are two separate folders containing further banks. You are free to create any sub-folder structure of choice to keep things clean and organized. E.g. you could save your custom banks to a separate folder.

Clicking on the bank load button always resets the chosen preset to preset 1, so that you can start exploring the new bank beginning at preset number 1 immediatly. This reset to preset 1 also will take place when no bank is loaded.

Save Bank:

Clicking on the „SAVE" button below „BANK" will open the file browser to save the current bank to the standard banks location. Read the „Load Bank" section above for details on this. We highly recommend not to overwrite existing library banks, so always give an edited bank a new custom name on saving. You can create sub-folders to keep thigs clean and organized. You e.g. could save your own banks all to a dedicated folder.

Load Preset:

Clicking on the „LOAD" button below „PRESET" will open the file browser to choose and load a preset. There are only some init presets available at factory state since all available presets are collected in banks. So the preset file menu is mainly thought for saving your own custom presets, which you may collect in a new custom bank later on.

The default loading location always is the same central place. In Mac it's /Users/Shared/SonicProjects/OP-X PRO-II/Presetbase/Presets, in windows C:\Users\Public\Documents\SonicProjects\OP-X PRO-II\Presetbase\Presets. The preset load button automatically should point to this location by default. If not then simply click all load and save (preset/bank) buttons once or twice which should re-set the buttons to the default path.

Save Preset:

Clicking on the „SAVE" button below „PRESET" will open the file browser to save the currently chosen preset. The preset will be saved with all changes you've done, including the name which you might edit too (text field) to make it unique and to describe it. The default file name always is the same as the preset name defined in the text field. You of course can edit the saved file name, but you should be aware that the preset name as displayed in the text field and the file name are not linked and can be different. So it might still be useful to use the default save file name (same as displayed name) as base and add eventual additions afterwards to avoid a mess.

The default saving location is always the same, for details read the „Load Presets" section above. This is extremely handy since you can save preset immediatly on the fly and don't need to care about file locations. If the path is not changed you can always again immediatly recall the preset again with „PRESET: LOAD" which points to the same location. So you can simply go ahead and collect presets on the fly while working, and organize or collect them in new banks anytime later. Of course you're free to create new sub-folders if needed. You only should be aware that presets by default will be loaded and saved from the last location you've loaded or saved from/to. The default loading location will only be reset to the root folder on re-launching the plugin again.

Copy:

NEW in 1.2: This button „freezes" (copies edits to bank slot) eventual edits so that they remain after changing presets. Otherwise the edit gets lost and after switching forth and back again the original unchanged preset is loaded. So you have the choice. You can save an edited preset as single preset for later use using PRESET->SAVE, so there's no need to freeze it within the current bank. This anyway would get lost again after loading a new bank.

Effects Section

Now let's have a look at the controls of the second area of the top bar, the effects section.

The buttons related to the effects section that are viewable by default are ON and EDIT below „EFFECTS", and ON below „PP" at the very right.

These however are just the upper level controls. By clicking on EDIT a lot of further controls will appear that alow to edit effects in detail.

Lets have a look at the main upper level controls first:

EFFECTS: ON
With this button all effects can be globally switched on or off. Grey mode means off, blue mode means on. This can be useful to compare the wet to the dry signal, or to prepare an effect setting in the background, that can be activated on demand. Some dry presets in the factory bank offer this option, others don't. The color of the button also gives an immediate indication if a preset uses effects or not. Don't forget to activate this button if you want to edit effects, otherwise there will be no audible effect.

EFFECTS: EDIT
Clicking on this button brings the detailed effects controls to the foreground. You can switch back anytime if you need to access the controls that are hidden behind in this mode. This setting is not saved with the preset and remains unchanged when changing presets.

PP: ON
This seems to be a somehow misterious control, and in fact it's more behind it than one would guess. Setting this button to blue state (=active) activates dual engine effects processing (PP = Parallel Processing). What is it? Normally, a VSTi uses the same effects unit for all patches. Since the effects settings normally are saved with the patch they will change immediatly when you switch presets, and dependent on how different the settings are the remaining effects finishing of the previous patch is cut immediatly. With parallel processing activated two identical effect units will begin to work, which are allocated alternately to the presets. So the previous preset keeps „its" engine while the new one drives the other „free" one. This allows the previous preset to finish its effects (e.g. delays) while the new one can be immetiatly used with the new settings. This allows for seamless preset changes without cut effects. Too long decays still can be cut by deactivating the PP button. Only use this feature with fast CPUs, on older ones the small CPU peak can lead to audible artefacts.

Now let's have a look at the detailed controls that can be accessed by clicking on EDIT:

1/1000 DISPLAY
This display shows the delay time in milliseconds when clicking on the DEL delay time trimpot on the right of the SYNC button. When the DEL trimpot is not tweaked the display just shows an „1" which has no meaning. Delay time can vary from 0 to 1000 ms. If SYNC is on, the delay time only will change in big quantized steps.

DEL
The left side „DEL" trimpot regulates the amount of the delay effect, which is always added to the dry signal. So it might be necessary sometimes to reduce the main volume when the delay level is very high to avoid clipping. There will only be an audible effect when „EFFECTS ON" is active and the delay time is greater than 0.

RVB
The left side „RVB" trimpot regulates the amount of the reverb effect, which is always added to the dry signal. So it might be necessary sometimes to reduce the main volume when the reverb level is very high to avoid clipping. There will only be an audible effect when „EFFECTS ON" is active and the reverb size parameter (SIZ) is greater than 0.

The effect parameters can be found on the right side of the SYNC knob. As already mentioned the levels get inactive when EFFECTS ON is inactive, but they are immediatly recalled when EFFECTS ON is active. So you can prepare a whole effects setting including absolute delay and reverb levels and make it active on demand with EFFECTS ON.

DEL: SYNC
With this knob you can synchronize the delay to the song tempo or to the arpeggiator. If the arpeggiator is on it will be synced automatically to the arpeggiator instead of to the song tempo. Since the arpeggiator itself can be synchronized to the song tempo („ARP" below „Sync to Songtemmpo" below the envelopes section), both can be synced at the same time. There are three modes of synchronization:

SYNC (blue): even/normal synchronization
3: Triolic (triple note) synchronization
DOT: Dotted (punctuated) synchronization

When synchronization is on the delay time only will react in big steps, based on the current measure and mode. Delay time only can be regulated in a linear way as long as the maximum delay time of 1000 ms is not overridden. If so the delay time will be halfed which can lead to even mode again.

Now let's advance to the controls on the right side of SYNC, which are the actual effect parameters. The small triangle in the black bar between the delay and reverb controls serves for launching a useful presets choice. More about the presets on the next page

Left side: delay parameters:

DEL
Lets you regulate the delay time from 0 to 1000 ms. While clicking on it the current value is displayed in the 1/1000 number display. The display will return to 1 afterwards again, but the 1 has no meaning. Since it's only a mono delay there's only one control for delay time. When SYNC is on, the delay time only will change in big steps, determined by the song/arpeggiator tempo and the used synchronization mode (even, triolic, dotted).

If the synchronization mode overrides the available maximum delay time of 1000 ms, the delay time automatically is halved, which can lead to even mode instead of dotted or triolic. So use the lower possible setting then.

The delay is not interpolated, so delay time changes can't be performed neathlessly. To avoid artefacts the delay output is automatically stopped as long as the delay time is changed. So it's not suited for realtime tempo changes in synchonized mode.

FBK
Lets you regulate the delay feedback. Set to maximum this can lead to endlessly repeated delays, so be careful with it.

Preset triangle: See next page.

Right side: reverb parameters:

SIZ
Lets you regulate the reverb size from 0 to very big (cathedral like).

WID
Lets you regulate the stereo width of the reverb signal. Note that the reverb has an m->s design, so also a mono sound can become stereo.

DMP
Lets you regulate the damping of the reverb, which in the real world is given by the material of the reflecting walls. For very crisp sound you may use more damping to avoid a harsh sounding reverb tail.

Delay and reverb always work in parallel, so they don't feed each other.

As you will have noticed in your experiences so far it can take some time to set the controls for a suitable effect setting for the current sound, including the levels and the effect parameters, even if there only are a few, especially if the controls all are in default 0 setting in untreated patches.

That's why we've implemented a very handy quick presets choice, which allows to set all controls inluding levels by a single mouseclick.

The preset settings have been chosen based on favoured settings used in already existing patches, and too with the aim to include often used standard settings.

This lets you immediatly put an effect over a dry preset, and try out different settings on the fly by stepping through the available presets.

The only pre-condition is that EFFECTS ON is set to active. Levels are set too by choosing a preset, but not too high to rather stay subtle than forced, so you may adjust them to a higher level once a preset is finally chosen.

The blue presets window can be opened and closed by clicking on the small down arrow (or triangle) in the black bar between the effect units:

Now you can choose an effect by clicking into one of the preset rectangles. The setting gets immediatly active. So you can check out different settings on the fly and listen to the audible result while playing:
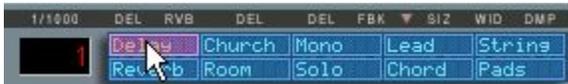
To close the window again click a second time on the down arrow:

Since the presets are very usable, either directly, or with a bit of additional tweaking, you will quickly notice that you'll soon won't do without them any more. Let's have a brief overview what's there:

Delay only:

Delay:
A simple usable 500ms delay without any reverb

Reverb only:

Reverb:
A usable standard reverb with medium size

Church:
A very big and warm reverb with a long tail, like in a church or cathedral

Room:
A very short and transparent reverb, comparable to an empty room

Mono:
A vintage type mono reverb; can be a nice contrast to stereo presets

Reverb and Delay:

Solo:
Church reverb (warm and long) combined with some standard delay. Very well suitable for all kinds of solo sounds that need to take off.

Lead:
A smaller and more transparent reverb combined with standard delay. Suitable for less washed out rock leads that need to keep some bite.

Chord:
A fat sounding reverb/delay combination for punchy polyphonic patches similar to Jump!

String:
A subtle and warm sounding reverb/delay combination that can give strings some added room feeling.

Pad:
A fat and warm sounding reverb/delay combination that is especially suitable to fatten pads and make them creamy and „hoovering".

Of course these are only bold describtions to make it easier to remember a preset. Of course you can use any preset for anything if it suits well!

MIDI CC Processing

LEARN / PROCC

The four buttons below LEARN and PROCC are dedicated to MIDI Continuous Controller (MIDI CC) processing, so the kind of MIDI data that is sent from external hardware to remotely control a knob or button of OP-X PRO-II.

Tweaking parameters with external hardware controls is much more fun than tweaking knobs with the computer mouse and can make the software feel like a real hardware instrument.

As you will see OP-X PRO-II offers a lot of options for this, including relative or fetched response for parameter-jump-free operation.

Let's have a look at the CC-related controls:

MIDI LEARN

New in 1.2: To avoid unwanted manipulations of knobs and buttons by incoming controller data OP-X PRO-II now in version 1.2 has no default mapping anymore, except for modulation (CC 01) and damper pedal (CC 64) which are fixed and can't be changed.

But OP-X PRO-II allows you to learn almost all knobs and buttons in the way you like it. New in 1.2: You now can learn ALL controls except for the small grey env / port trimpots. Also you now can unlearn single controls.

The dedicated controls for this are LEA and RES below LEARN, but you also can do it with the blue square button next to the „A" label in the levers section alternatively (e.g. if the learn buttons are covered by the effects window). You'll find a separate section in the manual for this way too.

LEARN: LEA
Using this button you can „learn" an external hardware control to a knob or button of OP-X PRO-II in a very easy way. When you click on LEA a small blue bar in the levers section will appear saying: CC learn...

Now just move the external control you want to learn (only a tad bit is enough) and then the control on OP-X PRO-II you want to assign to it. Finished! The display will disappear again and the controls are learned to each other. It also works vice versa. If nothing happens the chosen control can't be learned.

You of course can do this for as many controls as you like, one after another. The complete setting will be saved to a text file called „Controllers.txt", in Mac in /Users/Shared/SonicProjects/OP-X PRO-II and in windows computers in C:\Users\Public\Documents\SonicProjects\OP-X PRO-II and so will stay persistent even after closing the plugin. Technically seen you even could make a backup copy of this assignment file.

You also again can leave the learn mode without having done anything by just clicking a second time on LEA.

The only controls that can't be learned are the small grey envelope trimpots. But you probably won't miss this. To learn the effects section controls you simply need to open and close the edit view between the actions to be able to access the learn or reset (see below) buttons.

LEARN: RES
This button either can be used to reset a single control (new in 1.2) or to reset all controls at once so that everythinbg is unlearned again.

To unlearn a single knob/button first on click on LEA, then move the control you want to unlearn, and then click on RES. Then this control is unlearned and won't respond to incoming controllers anymore.

To reset/unlearn all controls at once click the RES button and keep the button depressed for about 4 seconds until the blue LED in the levers section flashes red. This is a protection against an unwanted reset by mistake.

As you can see learning controllers is fast, flexible and easy. You even can do it on the fly while playing, if you should feel the urge of tweaking a chosen knob with an external controller immediatly.

New in 1.2:

Program change learn:

Since the used VST3 SDK offers no MIDI program changes we implemented various methods to perform remotely controlled program changes by MIDI controllers. You can perform program changes by rotary knobs, by preparing a program change number and then send it on demand, by before converting standard MIDI program changes to CC (must be done in your host) and then treat it like a standard program change, and you even can remotely control the increment/decrement buttons by MIDI CC now, which all offers a fantastic on the fly control! Read more about it on page 85 ff.

CC PROCESSOR

The two buttons below PROCC (Process CC) are dedicated to processing functions for incoming and outgoing MIDI CC messages. The left button is responsible for the processing of incoming CCs, while the right one is for the outgoing ones.

Left button: PROCC: RCE

States:

PROCC: RCE (grey)
In this standard mode (grey color) the incoming MIDI CCs stay unprocessed.

Advantage:
Immediate reaction, GUI knob imediatly has the same value

Disadvantage:
Annoying value jumps

PROCC: REL
REL means relative response. Incoming MIDI CCs don't change the controls abruptly to the current value (which can lead to the well known value jumps), but instead adds or subtracts the relative movement of the external controller to the GUI control. So there are no value jumps any more.

Advantage:
No value jumps, immediate reaction to a controller movement

Disadvantage:
You need to turn the knob fully up and down to again reach the full value range, dependent on the direction and relative values

PROCC: FET
FET means fetch. Incoming MIDI CCs don't change the controls abrupltly to the current value (which can lead to the well known value jumps), but will only start to change the GUI control when it „fetches" its current value, or in other terms, overrides its value.

Advantage:
No value jumps, always access to full value range

Disadvantage:
Values only will start being changed after having „fetched" the current value

So, as you can see, the CC processing offers a lot of options to by-pass the well known annoying problem of value jumps when using normal standard controllers. For some parameters it's not that relevant, but for parameters like filter cutoff it can be essential in a live performance.

In fact, historically seen this is not a new problem of the virtual instruments' age. Early voltage controlled analog synths with patch saving capabilities had to solve this problem as well.

The controls of these machines were scanned by a cpu to send the values to the analog voltage controlled engine. When a new preset was loaded from the patch memory the controls of course did not match the new settings. So they did use exactly the same methods as offered in the PROCC engine to allow intuitive parameter control without value jumps. Some did use the relative method (e.g. OB-X rev.2), others the fetch method.

PROCC: BLO
Blocks all incoming CCs, exept for damper pedal and modulation wheel. This can be useful when you want to cut unwanted controller activities.

Right button: PROCC: OUT

In version 1.2 this button currently is non-functional since the plugin doesn't offer MIDI output as it did in 1.1. The former functions were:

PROCC: OUT (grey)
Non-functional in 1.2. Former function in 1.1: Passes MIDI to the plugin's MIDI output.

PROCC: BLO (blue)
Non-functional in 1.2. Former function in 1.1: Blocks MIDI to the plugin's MIDI output.

Savability of the top-bar controls:
The current state of the buttons that have a global fuction and keep their state during preset changes only can be saved and recalled from the first preset of a bank. So to save a bank in order to recall these settings make your settings in the bank's 1st preset and then save the bank. Then the gloabal settings will be recalled upon loading the bank.

The voice LEDs
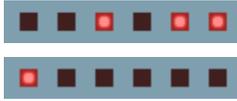
These LEDs indicate voice activity. Each voice has its propriate LED. That means, when a voice is receiving trigger data to play, its propriate LED shines. There are two rows of it, the upper one for voices 1 to 6 and the lower one for the voices 7 to 12. Dependent on the polyphony setting (next to the levers) the lower LEDs will show activity too. In the 8-Voice setting only the two middle ones will show activity (voice 9 and 10).

In unisono mode, all six LEDs of the upper row are glowing at the same time. Unisono always only uses the first six voices, so the lower LEDs won't shine, independently from the current polyphony setting.

These LEDs are the digital counterpart of the activity control LEDs that often were placed on the individual voice boards of vintage voltage controlled poly synth to indicate that a voice was receiving trigger voltage.

The MANUAL section:

At the top and at the bottom there are placed the voice activity LEDs, the top row for voices 1 to 6 and the bottom row for voices 7 to 12. The basic version of OP-X PRO only has six voices. A second bank of additional six voices has been added in OP-X PRO-II.

To keep the general overall sound untouched the tuning settings of the voices 7 - 12 always correspond to the settings of voices 1 - 6, which means: voice 7 sounds the same as voice 1, voice 8 the same as voice 2, and so on.

Have a look at the dedicated sections for more info.

VOLUME
Master volume. Its setting is stored with the preset.

TUNER
The individually and slightly detuned voices can be tuned here. Read the intro for comprehensive info on the backgrounds of voice tuning. Note: All detunings now also can be continuosly controlled, more about it on the following page. Here are the controls of this section:

OSC
Tunes the oscillators. In released state, each voice is slightly and individually detuned as it would be on startup in the originals. More subtle detunings can be achieved with the spread knob which also works in polyphonic mode.

FILT
Tunes the filters. In released state, the filter cutoff of every voice is slightly different, as it is the case in every original device that is not freshly serviced. These detunings can be altered for each voice with the FILT trimpot row in the MANUAL section (see MANUAL and „Tuning Trimpots").

ENV
Tunes the attack and decay times of the filter envelopes. In released mode, the attack and release time of every voices' filter envelope is slightly different. This gives organic life to pads and sweep sounds. These times can be tuned with the DEC / REL trimpot rows above the keyboard. See „Additional Knobs row" and „Tuning Trimpots" for more information.

The fourth element of the op-x' tuning capabilities is located in the addidional functions section below the filters section: the portamento detuner "**Port DET**". See "PORTAMENTO", "ADDITIONAL FUNCTIONS SECTION" and „Tuning Trimpots" section for detailed info.

Continuous detuning control:

Based on many user requests the amount of tuning/detuning now also can be controlled continuously instead of just on/off, for each of the four sections. This allows to choose any amount of detuning influence based on the current settings of the dedicated trimpots. This gives you incredibly detailed and subtle control over detunings.

The continuos amount is hidden in the background and can be accessed and adjusted by clicking into the text labels above the buttons and dragging the mouse vertically up or down. A blue digital display will pop up then and show the current values of each section.

The buttons of course still only are able to display two states. So LED dark means anything lower than 50%, and the LED shining means the amount is anything more than 50%. By clicking on the buttons themselves (as usual) the values will be reset to either 0 (LED dark) or maximum (=127, LED shinig). So it's up to you if you just want to use the buttons as usual (on/off) or access the hidden continuous control. The current value aways is saved with the patch, may it be just 0 or 127, or anything between.

To fine-adjust one section, just click into the dedicated text label just above the button (OSC, FILT, ENV) and drag the mouse vertically up and down. The popping up display will always show all three values:

The same can be done with the portamento detuning by clicking into the small area just above the button and again drag the mouse vertically up or down. The dedicated display will pop up in the filters section however:

SPREAD
Spreads the oscillator tuning of the voices - good for fattening up unisono sounds, but also for continuosly controlled detuning of polyphonic sounds in order to give them a tad bit of analog type warm-up-drift imperfection.

FILT Trimpots
These trimpots let you tune the filters of voice one to six, and at the same time the ones of the corresponding voices in the second row. This setting is only active when the FILT tune button is reseased (detuned mode). The standard detuning is the 12 o'clock setting (and this means not tuned equally). You can hear the settings with resonance set to a high amount. Find more info about the trimpot tuning in the „Tuning Trimpots" section of the manual.

The slightly different filter setting of the individual voices shows its strenght in the following situations:

Unisono patches with high resonance setting:

The slightly different settings spread the peaks a bit within the pitch spectrum which leads to a more gentle and natural tone. If the filters are tuned absolutely equally the peaks can add up to a too aggressive „one-frequency peak" which sounds stiff and one-dimensional.

Polyphonic filter-sweeps:

Sweeps will sound more organic and analog when filters are detuned a bit. The bigger effect will have the ENV detune in this case, which causes the envelopes not to rise and fall with the exactly same speed. However the individual filter settings will be added to it.

Sequences: Fine-adjust the filter settings for the individual steps

Calibrate by mouseclick:

The filter trimpots, as all other voice trimpots too, now can be quickly calibrated with a simple mouseclick. This makes it easy to find the „non detuned" starting point as base to create your own custom detunings, and to quickly reset them to the standard detuning.

Calibrate to equally tuned: Click into the area on the right of the trimpots.
Reset to standard detuning: Click into the area on the left of the trimpots.

The CONTROL section

PORTAMENTO
Also called "glide" sometimes. Makes the pitch change continuously between the notes. Short settings in unisono sounds makes the sound "squeak". The function also works in polyphonic mode. The portamento can be detuned with "Porta DET" in the additional functions section (below filters section). In released "Porta DET" mode, the portamento times of each voice are equal. In pushed mode the times slightly vary from voice to voice which was typical for the originals. The sonic result in solo sounds is a special "depth" while gliding.

UNISON
Stacks all six voices of the first voice bank for fat solo sounds. Use the spread knob or release the osc tune knob to fatten up the sound. The unisono mode always uses 6 voices, independently from the polyphony setting. Use the voice mutes to involve fewer voices than 6 and „Lega ON" for legato mode.

OSC 2 DETUNE
Fine tuning for oscillator 2. This is used to produce beats when both oscillators are on. This results in a fat and lively sound.

Trimpot
The trimpot below the detune knob lets you adjust the subtle beats between oscillator 1 and 2. In zero setting this is really zero which actually never is the case in VCOs, but in DCOs. In this setting the sound is determined by the random phase difference between oscillator 1 and 2. Fully turned right there are subtle and individual beats for each voice as it is normally the case in hardware devices even in „tuned" mode. This setting brings back the real hardware feel to the virtual world. For absolutely equal even-phase tuning you have to use the „SYNC" button in the oscillators section. So there are three variants for „tuned" mode in fact.

With manual LFO trigger activated („OSC" button below „Lfo Phase" in blue mode), this trimpot becomes the control to adjust the starting phase of the LFO wave. The influence on the beating is still active then, but is negligible then. Learn more in the dedicated section of this manual.

The MODULATION section

This is the section where the main LFO is controled and routed to the desired modulation aims. For the modulation lever, there's a separate and independent sine LFO (rate control above levers). The modulation lever can be switched back to the main LFO (ADDITIONAL FUNCTIONS SECTION, "Wheel LFO") if needed. The LFO on demand can be triggered by notes, delayed and faded in (see „Lfo Phase" in ADDITIONAL FUNCTIONS).

RATE
Regulates the LFO rate. The rate response is logarithmical. If the LFO is synchronized to song tempo (which can be done in the ADDITIONAL FUNCTIONS section with the LFO button, III for triolic behaviour), the knob will react in three big steps (multiplied by the song tempo).

The waveforms: Several waveform buttons can be switched on at the same time. This either will combine the chosen waveforms to a resulting new wave by adding their outputs or, corresponding to the printed marking below the buttons, it will result in a new pure waveform (sawtooth or triangle).

The available waveforms:

SINE
Switches on the sine wave of the LFO.

SQUARE
Switches on the square wave of the LFO.

S/H
Switches on the sample & hold wave of the LFO. Technically explained, white noise is "sampled" with the speed of the LFO rate. This results in a random step wave. Alternatively, the output of the lever LFO can be switched to the input to be sampled, often called „sampled vibrato" (e.g. OB-8). Switch the „AMP" button in this section to blue mode for this (two clicks), so until the LED shines blue. This mode will lead to repeated patterns instead of randomized ones. The result is dependent on the rates of both LFOs.

SAW: SINE & S/H
If the SINE and S/H button are activated at the same time, the LFO wave will become a rising sawtooth. You can convert it to a falling sawtooth by activating the Lfo Phase buttons (OSC, PW-FILT) in the additional buttons row (below oscillators section). This can be done individually for the wave sent to the oscillators and the one sent to filters, pulse width and amp. So one section can receive a rising sawtooth while the other one receives a falling one.

TRIANGLE: SINE & SQU & S/H
If all three buttons are pushed, the LFO wave will become a triangle wave. While this wave is similar to the sine wave it has a different behaviour in the extreme positions. A triangle wave does keep its rising and falling speed always the same and changes its direction abruptly at the max and min. A sine wave does constantly change its rising anf falling speed. It's flat at the extreme position and then becomes faster and faster until half way, then slows down again. While a sine wave is more convenient for a natural sounding vibrato a triangle is better for very slow modulations, e.g. of the filter cutoff frequency. Combined with the very slow possible LFO speed this can lead to great sounding slightly moving patches.

The other combinations will not switch on a new waveform. The waveforms will be added then to each other, which will result in a combined waveform which can deliver a quite interesting sonic result. Just experiment or try preset patches using it.

So the left combinations are:

- Sine & Square (gives a wider modulation with rounded edges)

- Square & S/H (the square is being randomized with steps)

FREQUENCY DEPTH

Regulates the modulation intensity of the LFO to the oscillators and the filter. The response of this knob is specially designed. In the first quarter, you have double logarithmic response which allows to make finest adjustments in very low modulation settings, e.g. for almoust imperceptible oscillator vibrato. The rest of the scale does react linear for fast changes.

OSC 1

Switches the above regulated LFO output to oscillator 1 pitch.

OSC 2

Switches the above regulated LFO output to oscillator 2 pitch.

FILTER

Switches the above regulated LFO output to the filter cutoff. The influence amount is dependent on the filter cutoff. Low cutoff settings result in lower LFO influence. This is again is behaviour copied from the analog originals.

PULSE WIDTH DEPTH

Regulates the modulation intensity of the LFO output to the pulse width of the oscillators' pulse waves and the amplifier. Its influence is added to the "WIDTH" setting in the oscillators section.

OSC 1

Switches the above regulated LFO output to oscillator 1 pulse width.

OSC 2

Switches the above regulated LFO output to oscillator 2 pulse width.

AMP

Two funtions are mapped here now:
LED orange: Switches the above regulated LFO output to the amplifier.
LED blue: When S/H is on, the input of the S/H sampling unit is fed by the modulation lever LFO (rate knob: just below lower voice LEDs row) instead of noise. This often is called „sampled vibrato" and results in repeated patterns rather than randomized steps. Read more in the S/H section.

The OSCILLATORS section

PITCH 1
Sets the pitch of oscillator 1 in five octave steps (QUA mode). In LIN mode the frequency can be adjusted continuously.

The waveforms:
You can choose between sawtooth, pulse and sine for each oscillator, or triangle for both. SAW and SQU on leads to pulse (so not two waves).

SAW
Switches on the saw wave of oscillator 1

SQU
Switches on the pulse wave of oscillator 1

SINE
The SINE wave will be activated when both buttons are **released**.

WIDTH
Manual regulation of the pulse width of both oscillator's pulse waves. Modulations for each pulse wave are added individually.

PITCH 2
Sets the pitch of oscillator 2 in semitones (QUA) or linear (LIN). The range is five octaves and 3 semitones. If sync is on, it controls the sync spectrum.

SAW
Switches on the saw wave of oscillator 2

SQU
Switches on the pulse wave of oscillator 2

SINE
The SINE wave will be activated when both buttons are **released**.

Triangle for both oscillators (new):

When both osillators are set to sine wave, the sine waves can be turned into triangle waves when the WITH knob is set to maximum.

X-MD
Cross modulation. This is sort of a simple frequency modulation between oscillator 1 and oscillator 2. The result is a disharmonic spectrum. The sound is determinate by the selected waves, the relation of the oscillators frequencies to each other and the modulation amount, regulatable with "**X-Md**" trimpot . In most cases, the pitch knob of oscillator 2 is used to regulate the sound. If the frequency of oscillator is modulated (by LFO or filter envelope - described later), the sound will change dynamically. If you want to hear only the FM output, you can switch off oscillator 2. Switch the black osc2 control from „QUA" (quantized) to „LIN" (linear) for continous tone search.

For yamaha type FM, release the wave buttons (both) for the **SINE** waves to become active. For a little bit more presence, the wave of oscillator 2 can be switched to SQU (Pulse). For even more clearness, the activation of ring modulation (ADDITIONAL FUNCTIONS section, "RING") is recommended.

In the ADDITIONAL FUNCTIONS section, there is a special function to give some additional movement to crossmod sounds: When you switch on the "**ENV**" button, the modulation depth is influenced by the amp envelope. (The same can be done with ring modulation - see later).

SYNC
Hard sync. Oscillator 2 is synchronized by oscillator 1. Everytime the oscillator 1 wave amplitude crosses zero, the oscillator 2 wave amplitude is set to zero too. The sonic result is the well known and famous sync sound with rich harmonics. As it is with cross modulation, changes of the oscillator 2 pitch results in changes in the spectrum. The whole story gets especially interesting when oscillator 2 is modulated by LFO or filter envelope.

QUA / LIN (black rectangles)
Click them to change from quantized (QUA; Osc1: octaves, Osc2: semi tones) frequency control to continuous / linear (LIN) frequency control. This will have an effect on both the main buttons and the trimpots.

FQ1 / FQ2
Fine adjustment of the frequencies of oscillator 1 and 2. The response is dependent on the black rectangles setting (QUA / LIN - see above).

XMD
Sets the amount of switched on x-modulation (cross modulation) AND switched on ring modulation (additional buttons section).

The FILTER section

A specially designed 12/24db low pass filter with an accompanying parallel multimode filter, inspired by the famous SEM, offers lots of possibilities. The SEM filter became famous with the beige SEM-Modules and the SEM based Four- and Eightvoice. The OB-X was the last OB synth that was equipped with this discrete design (but without multi mode). Later models, beginning with the OB-Xa, used the standard Curtis chips. One of the special things of the SEM filter is that in high resonance settings the sound remains as fat as in zero resonance settings. This is a wonderful thing for pads and sweeps. The old SEM filters had no self oscillation. In OP-X PRO-II you can switch it on if needed either by pushing the 24dB-button (in the additional buttons section) twice (the self oscillation lamp next to the modes display will shine now) or by clicking twice on the lamp itself (which will remotely-switch the 24dB button). Self oscillation can only be activated in 24dB mode. The classic SEM design (continous blending from 12bB lowpass to highpass which results in notch filtering in the 50/50 setting, with a separate fixed bandpass position) has been enhanced with switchable 12/24 dB slope in LP mode (the 24 dB switch is in the additional buttons section) and a continuously (!) adjustable multi-mode pole (only high pass in the SEM) that lets you blend from high pass over band pass to notch. Not enough with this the LP-multimode mix can be modulated by the main LFO and the filter envelope. Finally the additional buttons section has a button called DMP (p.40) which offers 4 different brightness modes.

CUTOFF
Regulates the filter cutoff frequency.

RESON.
Regulates the filter resonance. If self oscillation is activated (see above, small lamp shines) the filter will produce a sine wave at the highest setting.

ENV AMT
Regulates the amount of the filter envelope influence on the cutoff frequency. This is added to the cutoff setting.

Oscillators and noise levels:

As you can see the sources are switched by half or full amount to the filter. The levels alternatively also can be seamlessly controlled by clicking into the text labels above the buttons and then dragging the mouse vertically up or down. Also works with MIDI CC. More about it on the next page.

OSC1

Switches the full level of oscillator 1 to the filter.

New: The amount is also continously adjustable by clicking into the „OSC1"
label just above the button and drag the mouse vertically up or down. A small
display will pop up below „NOISE" and show the value.

The buttons' LED of course only indicates in which half the current value in the
background is (dark: smaller than 50%, shining: greater than 50%).

But the current value in the background is always active and is also saved with
the preset. By clicking on the button the value is being reset again einter to 0
(LED dark) or maximum (LED shining = 127).

So you're free if you just want to use on/off or continuous level control. This
works also for OSC2 FULL and NOISE FULL.

OSC2 HALF

Switches half of the volume of oscillator 2 to the filter. No continuous control
here, since this can be done with the „OSC2 FULL" button.

OSC2 FULL

Switches the full volume of oscillator 2 to the filter. If both knobs are activated,
there's a slight volume push. With this button, the level of osc2 alternatively too
can be continuously controlled in the same way as described in „OSC1" above.
Switch off „OSC2 HALF" for this, otherwise half the level is always added. For
continuos level adjustment click into the „FULL" text label and drag the mouse
vertically up or down. Again, a popping up display will show the value:

NOISE HALF
Switches half of the volume of the white noise generator to the filter.

NOISE FULL
Switches the full volume of the white noise generator to the filter. If both knobs are activated, there's a slight volume push. With this button, the noise level alternatively too can be continuously controlled in the same way as described in „OSC1" on the previous page. Switch off „NOISE HALF" for this, otherwise half the level is always added. For continuos level adjustment click into the „FULL" text label and drag the mouse vertically up or down. Again, a popping up display will show the value:

KEY
Keyboard tracking. It makes the filter cutoff follow the key position. In 100% amout setting each note then will have the same amount of harmonics. When filter self oscillation is switched on (two clicks on „24db) this can be heard the best. The keyboard tracking amount can be adjusted with the „KEY" trimpot. At maximum setting the filter pich follows the keyboard chromatically.

MIX trimpot
This trimpot lets you blend from 12/24 dB low pass (left or zero position) to the multimode filter (high pass - band pass - notch, dependent on the TYPE setting). With the multimode filter set to high pass the 12 o'clock position of the MIX trimpot results in classic SEM notch filtering (one small band missing). In this notch mode resonance can be added without loss of contour (which is not possible in the multimode filters' notch position).

TYP trimpot
Lets you continuously blend the multimode filter from high pass (left or 7 o'clock postion) to band pass (12 o'clock position) to notch (right position). The blending curve is logarithmic so that the pure bandpass mode can be located more easily. This continous blending option gives you the possibility to change modes on the fly without hard sound steps and also lets you adjust tone and high/low frequency amount very detailed. You can e.g. take a bit away the lows of the lopass mode blending a bit towards the bandpass mode for a slimmer sound. The modes in extreme the positions:

The modes in extreme positions:

HP (high pass): Filters away the low frequencies and leaves the high frequencies. Used for slim and thin sounding stuff to fit the arrangement/mix.

BP (band pass):Only lets pass a narrow frequency band. The resulting sound is well known from the guitar „wah-wah" pedals. It sounds somehow similar to lowpass filtering but with reduced lows.

NO (notch): This is the opposite to the bandpass filtering. It cuts off a narrow band. It's quite a subtle effect. The resonance has to be set to zero to hear it (if not the hole is filled by the peak). See above for SEM notch mode w/ res.

Self-Oscillation Lamp
The small square lamp next to the modes display indicates activated self oscillation. Self oscillation is only possible in 24dB-Lowpass-mode. It can be switched on either by pushing the already activated 24dB button (additional buttons row) a second time (the button led itself won't change) or by directly clicking on the lamp in activated 24dB mode. This will remotely-switch the 24dB knob to the corresponding state.

About self oscillation:

Self oscillation will make the filter produce a sine wave at highest resonance setting. Its frequency is determined by the cutoff. It can be either used for filter effects without any oscillator activated using all possible modulation options routed to the cutoff frequency (LFO, keyboard pitch, aftertouch, filter envelope) or for an additional harmonic to be added to the spectrum for e.g. organ or celesta type sounds. Be sure to activate key tracking then with tracking amout set to max that the pitch chromatically follows the keyboard.

For high resonant sweeps in 24dB mode self oscillation can be disturbing since it can conquer with the amplified partial tones of the filtered wave. Switch it off in that case (double push to return in 24dB mode since the switching is circular).

With detuned filters and deactivated/muted voices you can create a great variation of funny melodies that can be completely out of well tempered tuning. A wide field for interesting experiments.

KEY

Lets you adjust the amout of keyboard tracking. The keyboard tracking has to be switched on for this (KEY button - see above). Keyboard tracking lets the filter cutoff frequency follow the keyboard (dependent on the played note). In max position this is chromatical (same as played notes), in zero position the cutoff does not follow any more. Keyboard tracking is used to give all notes the same (or weighted) amount of brightness or partials, often present in natural instruments, or for chromatically playable fm sounds.

LFO (-MIX)

Lets the main LFO modulate the filter mix setting. The effect is dependent on the MIX trimpot position. The audible result is less stiff than a simple cutoff modulation. Great for never heard stuff.

ENV (-MIX)

Lets the filter envelope modulate the filter mix setting. The effect is dependent on the MIX trimpot position. The audible result is less stiff than a simple cutoff modulation. It can be combined with standard cutoff modulation. This option can produce very flattering and subtle sweeps.

It's helpful to really learn to operate the filter with all its possibilities.

E.g. be sure to turn all trimpots to zero (exept the „key" one) for pure lowpass mode, including the LFO and ENV trims on the right. We implemented a quick calibration option for this: Click on the small white OSC2 text below the buttons just above the self oscillation lamp, and it's done!

Apart from the distinct sound of a mode by itself the blending options also can be used for making the sound fit a mix without eqing. If there's e.g. a bit too much bass in the lowpass mode you can turn the mix-trimpot a bit in direction of the multimode pole set to bandbass. Then the bass will get less boomy the more you turn the trimpot clockwise. The sound will become more middy.

The filter of OP-X PRO-II lets you create almost any color you can think of by blending and mixing the modes and playing with resonance. So it's helpful to really understand what the modes by themselves actually do.

Don't forget the external controls in the additional buttons section allocated to the filter, including the 24db button and the DMP button, which lets you set the maxium pass frequency in for more or less brightness in 4 modes.

The ENVELOPES section
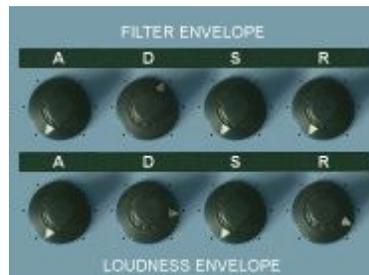
Two standard ADSR envelopes, the upper one routed to the filter cutoff, the lower one routed to the amplifier after the filter. ADSR of course means:

A Attack,
D Decay,
S Sustain,
R Release

Apart from the standard functionality there are several further options to use the envelopes for other modulation destinations or to change their behaviour, which are listed on the following two pages:

Filter ADSR to oscillator pitch and pulse width:

The filter envelope can be used to modulate the oscillators pitch and the pulse width. The knobs for this can be found on the bottom left side named OM and PM, combined with the „Filterenv Modulation" buttons located in the additional functions section. Learn more about it in the dedicated section.

Invert the filter ADSR:

OP-X PRO-II now allows to invert the filter envelope, as it could be done in e.g. Jupiter-8. It can be inverted by clicking two times on the right one „\" button in the filterenv buttons section. The LED will shine blue then:

The button normally is used to invert the influence of the filter envelope to the pulse width (orange LED mode, in combination with the „Envmod"-knobs below „CONTROL"). But this function is very rarely used and can be easily replaced by setting the pulse width to a different default position. When invert is active the filter ADSR will subtract its output from the cutoff instead of adding it, so you need to rise the cutoff to have an audible effect.

Linear amp ADSR attack:

For soft juicy slow attack strings it can be useful to have linear amp attack response instead of logarithmic (standard). This will make slow attacks softer and less impulsive. It's recommended to switch on legato mode („Lega ON", below „OSCILLATORS") when using linear attack, which will avoid cut away attacks and will force the envelope to start at zero for every new note. You can activate linear amp ADSR attack by clicking two times on „ENV" below the „FILTER" section until the LED shines blue and the small square shows „LNR":
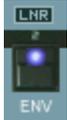
Filter ADSR to X-Mod and Ring Mod

When pushing the ENV button only one time (LED shining orange), the output of the modulating oscillator for cross- or ringmodulation is taken after the amp, which means that the amp envelope has an influence on the audible result. The influence can be heard when the decay and release times are short.

Filter ADSR to Filter Mix:

By rising the „ENV" trimpot in the filter section the filter envelope modulates the filter mix setting. The effect is dependent on the MIX trimpot position. The audible result is less stiff than a simple cutoff modulation. It can be combined with standard cutoff modulation. This option can produce very soft and subtle sweeps. Read more about it in the „FILTER" section.
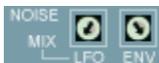
Minimum attack and decay times:

The attack and decay times can be rather short, like in real voltage controlled analog synths. You can check it out like this: Set all ADSR controls to zero, switch on all tuning buttons in the tuner section (OSC, FILT, ENV), switch off the oscillators and switch on noise instead, set resonance to almost maximum position (but only almost to avoid distortions), cutoff to zero and env amount to max, and play repeated notes. You will hear very short clicks (better audible with some reverb added). Increase then the amp envelope decay knob to max (the click will get punchier since there's more room for it) and then increase the cutoff (which brings in punchy tonal bumps).

The ADDITIONAL FUNCTIONS section (below filter)
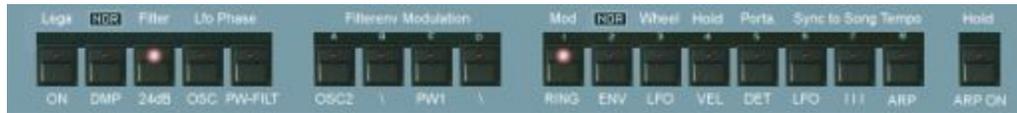
This section, formerly used to save and recall presets, offers a lot of additional functions, that often refer to the main sections. Several buttons now feature multiple states, that activate different functions, and are distinguished by the color of the shining LED, and for „DMP" and „ENV" additionally with a changing black rectangle index.

The abbrevations below the buttons are designed to remember what the specific button is for. We could not write a book below every button and mess the GUI, so you have to know what the abbrevations refer to. You simply have to learn it. It's easy to recall once you know it. Here's the list:

Lega ON

Used in unison mode:

Switches on legato mode when playing unisono patches. In legato mode the pitch always jumps back to the remaining hold note and the notes are only retriggered if all keys are released. In non legato mode the pitch doesn't jump back and the notes are retriggered every time, which is suitable for e.g. unison bass sounds.

The legato mode was the standard unisono mode in many old analog synths. However the pitch normally only jumped back from one side (in the OB-X from down to up) while in OP-X PRO-II it jumps back from both sides to a hold note. Legato mode was very popular for lead playing - holding one key as a center point and filddle around in with the other fingers.

Lega ON also has an effect when using manual or preset chords (learn more about it in the arpeggiator/midi processor section). For neathless legato match polyphony (if needed by deactivating voices) to the used chord.

Used in polyphonic mode:

In OP-X PRO-II switched on legato also has an effect in polyphonic mode. In polyphonic mode „Lega ON" set to active forces the envelopes to start at zero on every new note, instead of overtaking the current envelope level of the stolen note. This can be especially useful for patches with slow attack and low polyphony, even more when the amp envelope attack is set to linear (ENV button blue (LNR), see ENVELOPES section) . With „Lega ON" the notes of slow attack pads and strings will always start smoothly and melt into each other without audible breaks. Just experiment and listen, and use what suits and sounds best for the given sound.

DMP

DMP has become a multi functional button now, but is still dedicated to general damping (DMP = damp) or brillance. It takes an influence on the general cutoff level, the maximum filter opening level and the behaviour in this area. This all can stamp a unique character to the used sound, and make the filter more behave like the ones of early voltage driven synths, or a bit darker and rounder ones of later generations. The black rectangle, visually supported by the color of the shining LED, indicates the chosen mode. By clicking into it and dragging the mouse vertically upwards or downwards you can change between the modes without the need of stepping through all modes every time.

NOR (LED dark) - Normal

This is the standard mode, which has been used for all former OP-X sounds and probably still will be used for most sounds since it's perfectly usable and gives the sound a warm and slightly dark character, which has given OP-X the reputation of being one of the easiest to mix software synth available. In this mode the filter even with fully opened cutoff always has a small influence on the oscillators, tames a little bit the highest frequencies, because the highest possible cutoff frequency is still within the audible area. This is a similar behaviour to many „old" filters, e.g. the one of the Minimoog. The limitation of the maximum cutoff frequency also means that all kind of modulations (e.g. LFO) can't open the filter more and stay within this range. This guarantees for a sound that always stays warm and pleasant, never brittle or harsh.

DMP (LED orange) - Damp

Damps / reduces the filter cutoff by a fixed amount. This can be necessary if key tracking is switched on and the cutoff can't be lowered enough for very high notes.

CLR (LED blue) - Clear

In this mode the filter, other than in NOR mode, can be opened fully, up into the not any more audible area (infrasound area). This allows the oscillators to pass the filter untouched when cutoff is set to maximum, or lfo/env modulation intensity reaches into this area.

BRL (LED red) - Brilliant

The filter opens fully like in CLR mode, but the top addidionally gets an extra edge for cutting brilliance without the need of adding resonance. This mode is very close to the behaviour of some of the older polysynths like OB-X. But those synths also have the reputation of not being the easiest to mix, so be careful with this mode and only use it when it's really needed.

24dB

Switches the low pass filter effectiveness from 12bB (standard SEM mode) to 24 dB. The 24dB setting can be better for percussive sounds that need more effective filtering. It generally sounds a bit more present but also a bit colder and thinner. Not recommended for warm pads.

If the 24dB knob is pushed a second time in activated state this will enable self oscillation at maximum resonance setting. The knob led will not change its sate, but the self-oscillation lamp will get active in the filters section indicating self oscillation. This lamp and the button are linked, so you can also click on the lamp to do the same. Read more about it in the filters section.

Lfo Phase:

The two buttons related to this sub-section are multi-functional and take an influence on the phase behaviour of the main LFO. Which function is active is indicated by the color of the shining LED (orange or blue).

OSC

LED orange (one click):

Inverts the phase of the LFO modulation to the oscillators. This is helpful when the LFO is synchronized to a sequencer. If you want the LFO rise on 2 and 4 instead of 1 and 3, just push this button. Saw will get falling instead of rising.

LED blue (two clicks):

In this mode the LFO is triggered by played notes. This can be useful if you want to start the LFO on playing a note at always the same phase position of the LFO wave (otherwise it can be anything since the LFO is free running in standard mode). In this mode, the LFO will be triggered by the first note played, and will keep the current phase state until all keys are released, or until the damper pedal is released. So you can keep the current phase state fozen by holding at least one note or by holding down the damper pedal. When you play perfectly in rythm the phase of course won't change.

The great thing about this mode is that you can choose any phase position in the active LFO waveform as starting position. This can be done with the small trimpot below „OSC 2 DET" („CONTROL" section), which normally is used to „randomize" left beats in equally tuned mode, which is a very subtle effect and has not too much meaning any more when the LFO is used.

So in triggered LFO mode, you can adjust the starting phase state of the active LFO waveform with this trimpot:

This is how the trimpot setting corresponds to the starting position within the active LFO waveform:
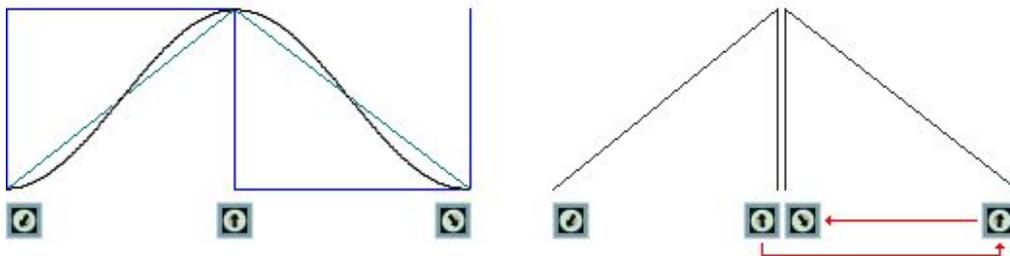
Sine, Square, Triangle:
The zero position of the trimpot corresponds to the lowest point of the wave, in the square wave it's right after the rising flank which is nore convenient, so that the entire part of that pole is performed. For starting at the opposite position of the chosen wave set the trimpot to 12 o'clock.

Sawtooth:
Since the OSC invert function can't be accessed in the manual trigger mode, the phase trimpot can access all phase states of both the rising and the inverted falling sawtooth. The left half, from zero to almost 12 o'cklock lets the starting point shift through the rising sawtooth wave. In the right half, the wave is inverted, and so is the mapping. To start the falling sawtooth at its top value set the phase trimpot to the maximum value. You can shift through the falling sawtooth by turning the trimpot from maximum back to almost 12 o'clock.

As you can see the trimpot was mapped to the phase states in the most useful way, which means that in the zero position there's always the most common starting phase state.

To get to know the phase shifting functionality a bit better you can e.g. activate LFO to oscillators, maybe half amount, with very slow LFO rate, and try out the trimpot's behaviour with different LFO waves. Don't forget to activate the manual trigger mode before (LED blue), otherwise there will be no effect.

Sync to songtempo:

With sync to songtempo activated for the LFO the manual triggered mode gets inactive since the LFO is already triggered by the host clock. With the blue LED active you however still have the possibility to change the starting phase with the phase trimpot as described above.

PW-FILT

Also the second button of the „Lfo Phase" section has a dual functionality, indicated by the different color of the shining LED.

LED orange (one click):

The LFO phase sent to the pulse width and the filter is inverted. If you want the LFO rise on 2 and 4 instead of 1 and 3, just push this button. Very important function again when synchronized to song tempo. Saw again will get falling instead of rising.

LED blue (two clicks):

In this mode the LFO can be delayed and faded in with an adjustable delay time and rising time. The modulation starts when a new note is played when no other note is being held. The delay time and rising time can be adjusted individually with the two „Velo/Stp" knobs in the arpeggiator section, which together with this have triple functionality (velocity sensitivity, chord arpeggio mode and speed, lfo delay time and rising time):

Velo/Mode:
Adjust the LFO starting delay from 0 - 10 seconds.

Stp/Speed:
Adjust the LFO modulation depth rising time from 0 to 10 seconds.

The rising curve will only start after the delay. So if you want to fade in the LFO from the moment a key is depressed set the delay to 0 and the rising time to something larger than 0.

LED blue (three clicks):

As you may have noticed the LED color still remains blue instead of going out after a third click. This in fact is a third mode, which is the same as the first blue mode, but with the LFO phase for pulse width and filter inverted, which amongst other things makes sawtooth falling instead of rising.

It was necessary to implement this inverted version since the PW FILT invert mode (LED orange) can't be accesed any more in the blue mode.

Filterenv Modulation:

OSC2
Makes the filter envelope modulate oscillator 2 only (if env modulation is activated). This is important for modulated sync- and crossmod sounds.

****
Inverts the effect oft the filter envelope modulation to the oscillators (if env modulation is activated).

PW1
Makes the filter envelope modulate pulse width 1 only (if env modulation is activated).

****
This button now features two different states, orange and blue, which have different functions each:

LED orange (one click):

Inverts the effect of the filter envelope modulation to the pulse width (if env modulation is activated).

LED blue (two clicks):

With this state active the output of the filter envelope (ADSR) is inverted, as it could be done e.g. in Jupiter 8. This means the ADSR output is not any more added to the cutoff, but subtracted.To have an audible effect you have to rise the cutoff to something higher to 0, otherwise the filter will stay closed since the modulation takes place in the lower than 0 range which means completely closed.

RING
Switches on ring modulation. Ring modulation means, that the output of one oscillator is multiplied by the output of the other (not the pitch as it is with x-mod). This sounds a bit different to the cross modulation. Please note that both oscillators have to be switched on to hear a result. The amount of ring modulation is set in the oscillators section with the „X-MD" trimpot (which also regulates the X-Mod amount). The ring modulation often can be used to brighten up sounds a bit, especially sine fm sounds.
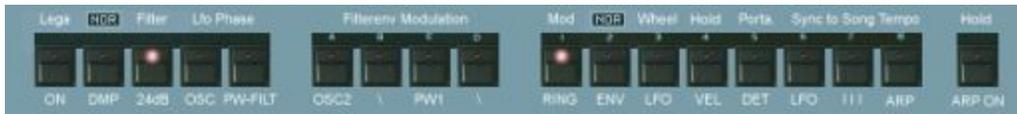
ENV

This button too has two functions mapped to it now, indicated by the black rectangle and visualy distinguished by the color of the shining LED (orange or blue). By clicking into the black rectangle and dragging the mouse vertically upwards or downwards you can change between the modes without the need of stepping through all modes every time.

NOR (led dark) - Normal: Functions inactive (normal state)

MOD (led orange) - Modulation:

A very special feature that can be interesting in arpeggiator mode: When pushing this button, the output of the modulating oscillator for cross- or ringmodulation is taken after the amp, which means that the amp envelope has an influence on the sonic result. The influence can be heard when the decay and release times are short.

LNR (led blue) - Linear:

In this mode the attack segment of the amplifier envelope (lower ADSR) is switched to linear instead of logarithmic (standard).

This will make slow attacks softer and less impulsive. This can be useful for juicy soft strings or pads with very slow attack. It's recommended to switch on legato mode („Lega ON", below „OSCILLATORS") when using linear attack, which will avoid cutted attacks and will force the envelope to start at zero for every new note. You can activate linear amp ADSR attack by clicking two times on „ENV" below the „FILTER" section until the LED shines blue and the small square shows „LNR":

Wheel LFO
In activated state this knob causes two LFO routings to change at the same time:

1. The main lfo is routed to the lever (wheel) lfo modulation instead of the extra wheel lfo (speed control above levers). This can be useful if you want to control the main lfo's pitch modulation with the lever (wheel) or generally want the added modulation to have the same speed as the one of the main lfo.

2. The lever (wheel) LFO is routed to the panning modulation instead of the main lfo. This can be useful if you want to have a panning modulation speed independent from the main lfo which is e.g. used for other important stuff. This allows e.g. to have a relatively fast vibrato modulation and at the same time very slow motion panning.

Hold / VEL

In normal state this button switches velocity sensitivity on. The velocity will have an effect on the filter envelope. Combined with the filterenv modulation, not only the cutoff can be velocity controlled, but also pitch and pulse width (dependent on the **OM** and **PM** settings). The velocity range and response can be regulated in the additional knobs row with the two knobs connected to „Velo", the left one for the minimum (called „Floor" as parameter) and the right one for the max (called „Ceil" as parameter). NEW IN 1.3: Upon a second click to blue LED state velocity goes to volume (amp). No scaling here.

In arpeggiated chord mode (Double or Preset Chord with double-activated ARP-ON button - led shining red) this button is used for hold instead of the Hold/ARP-ON button (because of the double function). Velocity is not available then anyway, so this button is free for another function. Read more about it in the Arpeggiator section. Note that you alternatively can activate hold remotely controlled with the damper pedal, see dedicated section.

Porta DET

Portamento detune. In released "Porta DET" mode, the portamento times of each voice are equal for snappy "squeek". In pushed mode, the times vary from voice to voice which was typical in the originals. The sonic result in solo sound is a special sort of "depth" while gliding. If you really need to you can alter the voices' individual portamento detunings with the dedicated trimpot row in the levers section (POR). Have a look at the „Levers" and „Tuning Tutorial" section in this manual for more details. Portamento detune is absolutely essential to capture the magic of many old polyphonic analog synths.

Portamento detune now also can be continuously controlled on demand by clicking into the small area just above the button (small number) and dragging the mouse vertically up or down. Read more in the „TUNER" section.

Sync to Songtempo:

LFO

Synchronizes the LFO to the song tempo of the sequencer. In this mode, the RATE knob will react in three big steps only, dependent on the tempo. Note, that the phases of the individual LFO sections can be inverted (OSC / PF).

III

Switches on triolic synchronization mode (multiples of three notes per beat).

ARP

Synchronizes the Arpeggiator to the song tempo of the sequencer. In this mode, the Speed knob will react in three big steps only, dependent on the song tempo.

Sync to Songtempo: LFO phase

When the LFO is synchronized to the songtempo (LFO), the pase is matched to the bar starts and always starts at 0. There are however several options to adapt the phase state to your liking:

1. With „OSC / PW-FILT" below „Lfo Phase"

With these two knobs you can invert the pase of the LFO separatly for the oscillators (pitch) and the pulse width and filters (cutoff). This allows to operate the LFO off-beat or change the relative behaviour of both groups by 180 degrees, which can be useful sometimes.

2. With the phase trimpot when OSC is blue (manual LFO trigger)

When the LED state of the OSC button below „LFO Phase" is blue (two clicks), the phase of the LFO can be freely adjusted with the trimpot in the CONTROL section. Manual triggering is automatically set to inactive when the LFO is synchronized to the songtempo since the LFO already is triggered by the sequencer clock.

For details on how the trimpot setting corresponds to the phase state of the different LFO waves read the „Lfo Phase" section of this manual.

ARP ON
This button has several functions, dependent on the environment:

1. Switch on the Arpeggiator/MIDI-Processor. Learn more about it in the Arpeggiator/MIDI-Processor section.

2. Hold a non-chord (normal) arpeggio by clicking a second time on it. The color of the led will turn to red. Hold also can be activated remotely controlled with the damper pedal, just by depressing and again releasing it again within less than about half a second. More about it the dedicated section.

3. Switches / indicates record ready and play mode for the arpeggiator presets .3 (Manual Chord) and .4 (Step Sequencer). Orange led means: record ready. In this state you can play and hold your chord or enter the notes for the sequence. In led-red mode (led shines brighter and red after pushing the button a second time) the chord is being fixed or the sequence will be played back. Learn more about it in the Arpeggioator/MIDI-Processor section.

Find more details on the arpeggiator/midi processor in the dedicated section of this manual.

The ADDITIONAL KNOBS row (above Keyboard)

You won't find the knobs above the keyboard in the originals. These are all additional functions or functions which were only accessible after opening the case of a device or not at all. From left to right:

LFO
Regulates the speed of the separate modwheel sine LFO. It's routed to the modulation lever (or wheel in modern terms). This LFO can be switched to the panning modulation instead with the „Wheel LFO" button in the additional buttons section if you need a separate lfo for it. Then the main lfo will be routed to the lever modulation instead. If „sampled vibrato" is on (ENV button blue in LFO section & SH on), this LFO is the SH sampling source.

Aftertouch:

A Vib.
Regulates the aftertouch (key pressure) influence on the oscillator vibrato. This is driven by the LFO switched to the modulation wheel.

A Filt.
Regulates the aftertouch (key pressure) influence on the filter cutoff. Great for expression.

Envmod:
OM
Regulates the amount of the filter envelope modulation to the oscillators. Have a look at the ADDITIONAL FUNCTIONS section description for further options (OSC, \ ). Handy feature: You can click on „OM" to set it to 0.

PM
Regulates the amount of the filter envelope modulation to the pulse width. Have a look at the ADDITIONAL FUNCTIONS section description for further options (PW, \ ). Handy feature: You can click on „PM" to set it to 0.

TUNE
Master tune. The default setting is 12 o'clock. The pitch can be adjusted up to one semitone down (turn it left) or up (turn it right) to adapt the overall pitch to acoustic instruments with deviating tuning. To set the knob back to exact center position (standard tuning) simply click on „Tune".

DEC / REL
Trimpot controls for the decays (DEC) and releases (REL) of the filter envelope. These trimpots let you tune the slightly different decay and release settings of the filter envelopes in detuned mode (ENV button in tuner section released) for each voice channel (1 to 6 from left to right). This setting will only have an effect in detuned mode (ENV released). The envelopes in real old hardware synths never did close for each voice with the exact same speed which gave sweeps a special life and richness. This could be annoying for brass (and other) sounds however, so the envelopes detuning can be switched off with one button in OP-X PRO-II for these sounds (with the „ENV" button in the MANUAL section). The manual tuning of the filter envelopes is definitely something for specialists or folks that want to copy their hardware device 1:1. Especially in downsweeping stacked unisono sounds these settings have a huge effect on the overall sound - a good example for it is the famous „Tom Sawyer" sound from Rush. Without these slightly different envelope times this famous sweep will sound stiff and unreal because all old analog synths had these slight offsets. For a detailed tutorial for envelope tuning have a look at the „Tuning Trimpots" section in this manual.

Calibrate by mouseclick (new):
The trimpots now easily can be calibrated with a simple mouseclick:

Click on „C":

The „DEC" trimpots are tuned to equal times for all voices, which is the same as if the „ENV" button in the „TUNER" section is active. This can be useful to have a neutral starting base to adjust them to own custom detunings.

Click on „D":

Resets all „DEC" trimpots to the implemented standard detuning.

The same for the „REL" trimpots:

Click on „L": Calibrates all „REL" trimpots to equal times (same as tuned)
Click on „R" to reset all „REL" trimpots again to the standard detuning.
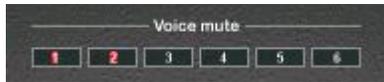
Voice mute

These six buttons, corresponding to the 6 voice channels, let you individually mute and now at the same time also deactivate single voices. If polyphony is switched to more than six voices (8 or 12) the buttons will also mute the corresponding voices in the second row.

1: Mutes and deactivates voices 1 and 7
2: Mutes and deactivates voices 2 and 8
3: Mutes and deactivates voices 3 and 9
4: Mutes and deactivates voices 4 and 10
5: Mutes and deactivates voices 5 and 11
6: Mutes and deactivates voices 6 and 12

With complete deactivation instead of just muting now the voice allocation engine distributes the incoming voices only within the left active voices, and this still always in rotating mode.

Application for custom polyphony settings:

Apart from disco light type flashing effects (can be very nice, especially using the sequencer!) this also can be used to realize any polyphony setting apart from the main 6/8/12 ones, with any voices you want to have involved. This allows to create real 2/3/4/5/any - voice polysynths, as well as real monosynth using just one voice of your choice. The computer's processor only will be charged with the active voices, so a monosynth will have dramatically lowered cpu usage compared to just muting the voices (as it could be done in OP-X PRO). The only limitation is that the corresponding upper and lower voices share the same deactivation button, so the only can be activated/deactivated both at the same time.

Application for voice tuning:

Apart from polyphony / custom synth application the muting/deactivation of voices also can be used for tuning purpose, so for tuning individual voices by listening to them alone and comparing them to other ones (also switch unisono mode for this). Read more about it in the comprehensive tuning tutorial section of the manual.

For normal application it's however still recommended to use the „all voices active" mode combined with the standard 6/8/12 polyphony switch in the levers section, since detunings have been adjusted to work together.
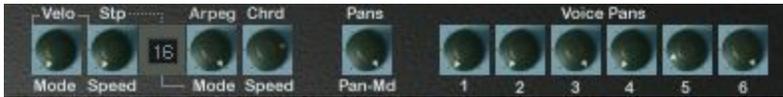
Grouped multi functional knobs with display:

The next group of four buttons with number display in between are mainly dedicated to the Arpeggiator/MIDI-Processor which will be described in a comprehensive separate section. They have several functions, depending on the state. The first two knobs also serve as control for the velocity amount, and in delayed LFO mode („Lfo Phase:PW-FILT" blue) also to control the delay and rising time. Read more about this feature in the LFO section. The reason for this packing is that the new Arpeggiator/MIDI-Processor was implemented additionally in OP-X PRO-II without adding any further controls to keep the patches fully compatible to the standard version.

Dependent on the current state the display will show different values which represent a certain mode or state. This allows to handle the multitude of packed features in a very fast and intuitive way.

A brief overlook including the functions not related to the Arpeggiator before we will get into it deeper in the extra Arpeggiator/MIDI-Processor section:

Velo: Velocity Amount:
With the two knobs joined with lines to „Velo" the velocity amount to the filter envelope can be controlled in detail. These knobs only have an effect if the VEL button above is activated and velocity is available. In running arpeggio mode velocity is not available. Then these two knobs will receive other functions, dependent on the current mode (see next page).

Left knob: Floor
Sets the lowest point of velocity - it's the filter envelope (=cutoff) setting if velocity is zero.

2nd function: Arpeggio mode in double/chord arpeggio mode
3rd function: LFO delay in LFO delay mode (Lfo Phase: PW-FILT blue)

Right knob: Ceil.
(Ceiling) This sets the maximum influence position of the velocity towards the filter envelope.

2nd function: Arpeggio speed in double/chord arpeggio mode
3rd function: LFO rise time in LFO delay mode (Lfo Phase: PW-FILT blue)

Arpeggiator / MIDI-Processor

Exept for the „foreign" functions of the two knobs on the left of the display for velocity control (see above) this group of four knobs with accompanying display is dedicated to control the Arpeggiator/MIDI-Processor.

This processor has been completely re-programmed for OP-X PRO-II and was „packed" into the synth without adding or changing any controls to stay fully compatible patch-wise to former versions.

This is also the reason why there are some double functions. But you will see that you never have to think about it since the functions will change automatically dependent on the current state. The added number display and double inscriptions make the handling as comfortable and fast as it wouldn't even be with more controls.

That's even more amazing if you have a look at the plentora of features packed into this little machine:

Arpeggio modes:
Notes sorted by input order, notes sorted by pitch, random mode, available directions: up, down, up & down, range 1 to 4 octaves, stepped mode, repeat

MIDI-Processor functions:
Manual chord hold, preset chords, double mode, sequencer

This allows to imitate almost all important arpeggiators of former days, including the famous jupiter 8 one (which did not sort the notes by pitch but by their input order and did not compress them to one octave) as well as some other nice features like chord memory (ob-x), on the fly note sequencer (synthex, ems synthi a) and double mode (two notes played at the same time, e.g. crumar bit99) for fat notes without unisono.

In good old SonicProjects tradition we did not stop here. Apart from the possibility to hold and play a chord with one key we implemented a bunch of pre-saved preset cords, the ones used most of the time anyway, with the possibility to arpeggiate them as well. You'll also find again the old OP-X step sequencer, with steps variable from 1 to 8 and two repeated modes, and with switchable hold mode. All modes can be changed while playing on the fly without interruption. This modes-morphing even can be automated.

Another handy feature ist the ability to activate an deactivate arpeggio hold remotely controlled by the damper pedal. See next page, bottom.

Arpeggiator/MIDI-Processor introduction: see previous page

So let's have a brief look first at the involved buttons and knobs before we get into the description af all the available modes:

ARP ON
This button has several functions, dependent on the environment:
Start arpeggio, hold, record, play

1. Switch on the Arpeggiator/MIDI-Processor.
What happens then depends on the current mode (set by right mode knob).
For chord hold and sequencer this also means: record ready

2. After a second click the knob's led turns to deep red.

In non-chord arpeggio mode this causes the arpeggio to hold. The hold also can be activated remotely controlled with the damper pedal, by depressing and again releasing it within less than half a second. Read more on page 52.

In the „Manual Chord" and „Step Sequencer" mode this state will fix the chord or play back the recorded sequence.

In the „Double" and „Preset Chord" mode this state causes the chord or double note to arpeggiate. The arpeggiator controls for mode and speed then are the two knobs on the left side since the mode has to be kept and the speed knob on the right side is used to change the preset chord. Hold can be activated then with the „Hold VEL" button:

You can activate and deactivate hold in both normal and chord or double arpeggio mode all remotely-controlled by quickly pressing and again releasing the damper pedal within less than half a second. This still allows for normal pedal use without (de)activating hold at the same time.

After describing the buttons let's have a look at the dedicated knobs. The center of all and main knob is the „Arpeg Mode" knob.

It sets the main mode which causes all other controls to change their function accordingly, dependent on the chosen mode:

Arpeg Mode:
This one is the only uni-functional of the four. It lets you choose one of the 32 Arpeggiator/MIDI-Processor modes (only active when the ARP ON knob is switched on). There are two groups of 16 presets, the first group indicated with a green point. Have a look at the modes list in this manual to learn which number belongs to which mode.

Chrd / Speed:
In normal arpeggio mode this knob sets the arpeggio speed. In synced-to-songtempo mode (with ARP button below „Sync to Song Tempo" active) in will only react in big steps, dependent on the song tempo. In the Preset Chord mode (.2), this knob serves for choosing one of 16 preset chords. Have a look at the chords list in this manual. If the chord is being arpeggiated (second click on „ARP ON"), the speed knob (as well as the mode knob) is the one on the left side instead (Stp/Speed). Hold is then „Hold VEL" (see page 26).

Number display:
Shows the number of the chosen mode. Click on the „Arpeg Mode" knob to see the actual name and function of the preset. This display will also show the preset number, mode number or steps number of other knobs while clicking on them.

Right side: These two knobs normally are used for velocity amount control. In apreggiated double or chord mode and hold steps mode they change their dedication to:

Mode (Velo above)
In arpeggiated Double- and Preset-chord mode (modes .1 and .2 with ARP ON button pushed to hold/red state) this knob lets you choose the arpeggio mode. The current mode number is shown in the number display when you click on the knob. Have a look at the modes list for more details.

Stp / SPEED
In arpeggiated Double- and Preset-chord mode (modes .1 and .2 with ARP ON button pushed to hold/red state) this knob regulates the arpeggio speed. In the main modes 1 - 3 (Steps), this knob is used to set the amount of steps (which are only active in hold mode). The number display will show the number of steps while klicking on the knob then.

So, after introducing all the involved controls let's finally describe all the modes in detail, how they work and how to use them:

The main modes:
(switched by „Arpeg Mode")

First of all the definition of a few terms appearing in all arpeggio modes:

Order:
The notes are played back in the same order as they were played in, like in the old jupiter 8 arpeggiator, leaving them in their original octave. Suitable for interesting, experimental and wild arpeggios.

Pitch:
The notes are auto-sorted by note pitch before they are arpeggiated, the common way of arpeggiating. Suitable for „Chopin-Style" chord arpeggios or contolled electronic (double-note) arpeggios.

Rand:
Random play, which means the notes are sorted with a random function. This can be quite inspiring and animated. The jupiter had this feature too.

Up:
The notes are arpeggiated upwards, octaves change upwards too. In order mode it's simply the original order.

Down:
The notes are arpeggiated downwards, octaves change downwards too, beginning from the highest point back to the base. In order mode the playing order is changing its direction.

Up Down:
Both combined, take the place of each others sequentially. The notes at the changing direction points are not repeated. Think of Chopin's piano etude 1, played perfectly, without any exercise.

So now finally the listing and explanation of the main modes:

The main modes:
(switched by „Arpeg Mode")

There are two banks of 16 presets, the first bank marked with a green point in front of the number.

.1: Double
Causes one key to play two notes at the same time with the same pich. The additional note is distributed to the next free voice, in circular mode, as usual. Since no voice sounds exactly the same this makes the tone fat and lively. You can fatten in up by the „Spread" knob which will cause a wider difference of the pitch between the two notes. Polyphony is halved of course, so it's useful to switch to 12-voice mode to still have a six-voice polyphony. The double mode can be arpeggiated by clicking a second time on „ARP ON" (red state). The mode and speed controls are the ones on the left then, hold is „Hold VEL".

.2: Preset Chord
One played key causes a pre-saved interval or chord being played. There are 16 presets available which can be chosen with the „Chrd / Speed" knob. The chord can be arpeggiated by clicking on the „ARP ON" button a second time which will turn the led deep red. The controls for the arpeggio mode and speed are to find now on the left. The arpeggio can be held with the „Hold VEL" button instead of the normal way, or with the damper pedal.

The chord pesets (chosen by „Chrd" knob):

  .1: Oct : one added lower octave
  .2: Oct double: the same, but doubled
  .3: Oct Lower Upper: a lower plus an upper octave added
  .4: Oct Unison: the same, but triple, using all six voices in 6-voice mode

  .5: Fourth: a fourth added
  .6: Fourth Double: the same but doubled
  .7: Fourth Unison: the same, but triple, using all six voices in 6-voice mode
  .8: Fourth Oct: a fourth plus and octave added

  .9: Fifth: a fifth added
.10: Fifth Double: the same but doubled
.11: Fifth Unison: the same, but triple, using all six voices in 6-voice mode
.12: Fifth Oct: a fifth plus and octave added

.13: Major Chord: a major triad added
.14: Minor Chord: a minor triad added
.15: Minor Seven: a minor triad with a small seventh added
.16: Penta Oct: four octaves added, two below and two above

Arpeggiate Double and Preset Chord mode:

Click a second time on „ARP ON" for this. The led will shine deep red now. The controls for mode and speed are the two on the left side of the number display now (because the regular ones have different funtions in these modes). The button for holding the arpeggio is now „Hold VEL" in the buttons row on the left side of „ARP ON". Alternatively you can also activate hold all remotely controlled with the damper pedal, by quickly depressing and again releasing it within less than half a second. Read more about it in the introduction.

The chord arpeggio modes:

The terms are the same as in normal (non-chord) arpeggio mode. The modes have been reduced to the 16 most important ones that also make sense in combination with chords. For details read the introduction of the arpeggiator section. Remember the three terms concerning order of playing which are not self declaring in any case:

Pitch:
The notes are automatically sorted by note pitch before being played

Order:
The notes are played back in the same order as they were played in

Rand:
Random play, which means the notes are sorted with a random function

The modes:

  .1: Pitch 1 Oct Up
  .2: Pitch 2 Oct Up
  .3: Pitch 3 Oct Up
  .4: Pitch 3 Oct Down
  .5: Pitch 2 Oct Down
  .6: Pitch 1 Oct Down
  .7: Pitch 1 Oct Up Down
  .8: Pitch 2 Oct Up Down
  .9: Pitch 3 Oct Up Down
.10: Order 1 Oct Up
.11: Order 2 Oct Up
.12: Order 2 Oct Down
.13: Order 2 Oct Up Down
.14: Order 3 Oct Up Down
.15: Rand 2 Oct Up Down
.16: Rand 1 Oct Up

The directions (up, down, up down) always lead to the base. Up means the notes are played upwards beginning from the origin. Down means they are played downwards beginning at the highest octave towards the origin. In order mode, down direction causes the octave internal playing order being inverted.

.3: Manual Chord

This mode allows to temporary hold a chord and play it with a single key. This feature can be found in some vintage polyphonic analog synth. In the OB-X this feature was hidden and handled with the hold and reset buttons. As in the original, the chord will get lost after changing the mode or switching the plugin off. It's a realtime feature which can't be saved within a preset. Use the chord presets for this.

How to hold an play back a chord:

Record chord:
The normal active state (led orange) of the „ARP ON" button means record ready. Be sure you have not entered any notes already after switching into the step sequencer mode. Otherwise release the button completely (led dark) and set it in record mode again. Play and hold a chord on the keyboard. The reference point is always the middle c (C3, Note 60 or C'). This means: What will be saved is the relative distance to this reference note. If you need both hands for your chord you can also hold it with the damper pedal.

While holding the chord (manually or with pedal) click a second time on the „ARP ON" button which causes the led to shine deep red. The chord is fixed now and is ready to be played. You can release the keys or the pedal now.

When you hit a single key now the entered notes will be played together with the played note, causing a chord. Of course this will reduce polyphony accordingly. So it can be helpful to switch to 12-voice mode (next to the levers). Of course you can play the chords also polyhonic, however voices will be used up quite fastly like that. Nevertheless this can lead to extremely rich and fat chords which would not be possible with normal playing.

If you want to clear the current chord just release the „ARP ON" button, set it active again (orange) and enter a new chord. If nothing is entered then the saved chord remains until mode is switched. If some notes of the old chord should remain nevertheless then do the same and additionaly switch the mode forward and back again. If you have used preset chords before the last used preset chord will remain in the chord memory. That's because the two modes share the temporary chord memory.

Manual chords can't be permanently saved or arpeggiated. Use the preset chords (mode .2) for this.

.4: Record

A nice little feature which can be quite funny. It's a very simple note sequencer with 8 steps at most. You can record a short sequence of notes, play them back then with variable speed and edit it on the fly using the keyboard by just entering new notes. It's similar to the former OP-X sequencer, but playback will only start after activating it. This makes it easier to enter the perfect line. Recording, playing back and editing work like this:

Record notes:
The normal active state (led orange) of the „ARP ON" button means record ready. Be sure you have not entered any notes already after switching into the step sequencer mode. Otherwise release the button completely (led dark) and set it in record mode again. Play a short line of 8 notes at most (but it can be less), one note after each other (chords are not supported). The speed of entering does not matter, each new note will simply be saved within the next memory place. If you made a mistake, just release the „ARP ON" knob once more completely (led dark) and set it to record active again.

Play back and edit sequence:
If you are pleased with your entered line then click a second time on „ARP ON" which will cause the led to shine deep red. The line will be repeadedly played back now. You can set the playback speed with the „Chrd / SPEED" knob. You can edit the sequence on the fly by just entering new notes on the keyboard. Editing work in circular mode, which means that every newly entered note causes the next step to be ready for overwriting. The length of the sequence will stay fixed to the length of initial entering. Alternatively, and that's very handy, you can start and stop the playback by quickly depressing and releasing the damper pedal within less than half a second.

Of course you can synchronize the speed to the song tempo, just activate the „ARP" button below „Sync to Song Tempo" for this (III additionally for triolic mode). The speed knob will react now in big steps, dependent on the song tempo.

Now the „normal" (exept mode 1, 2 and 3) arpeggio modes will follow. They all can be synchronized to song tempo as well (read section right above):

.5: Pitch 4 Oct Down
 Arpeggiate, notes sorted by pitch, range 4 octaves, direction down

.6: Pitch 3 Oct Down
 Arpeggiate, notes sorted by pitch, range 3 octaves, direction down

.7: Pitch 2 Oct Down
 Arpeggiate, notes sorted by pitch, range 2 octaves, direction down

.8: Pitch 1 Oct Down
Arpeggiate, notes sorted by pitch, range 1 octave, direction down

.9: Pitch 1 Oct Up Down
Arpeggiate, notes sorted by pitch, range 1 octaves, direction up & down

.10: Pitch 2 Oct Up Down
Arpeggiate, notes sorted by pitch, range 2 octaves, direction up & down

.11: Pitch 3 Oct Up Down
Arpeggiate, notes sorted by pitch, range 3 octaves, direction up & down

.12: Pitch 4 Oct Up Down
Arpeggiate, notes sorted by pitch, range 4 octaves, direction up & down

.13: Pitch 4 Oct Up
Arpeggiate, notes sorted by pitch, range 4 octaves, direction up

.14: Pitch 3 Oct Up
Arpeggiate, notes sorted by pitch, range 3 octaves, direction up

.15: Pitch 2 Oct Up
Arpeggiate, notes sorted by pitch, range 2 octaves, direction up

.16: Pitch 1 Oct Up
Arpeggiate, notes sorted by pitch, range 1 octave, direction up

Second bank (without green point):

1: Order 4 Oct Down
Arpeggiate, notes sorted by input order, range 4 octaves, direction down

2: Order 3 Oct Down
Arpeggiate, notes sorted by input order, range 3 octaves, direction down

3: Order 2 Oct Down
Arpeggiate, notes sorted by input order, range 2 octaves, direction down

One octave down was left out because it only will cause the playing order
being inverted which is rather irritating than being useful.

4: Order 1 Oct Up Down
Arpeggiate, notes sorted by input order, range 1 octave, direction up & down

5: Order 2 Oct Up Down
Arpeggiate, notes sorted by input order, range 2 octaves, direction up & down

6: Order 3 Oct Up Down
Arpeggiate, notes sorted by input order, range 3 octaves, direction up & down

7: Order 4 Oct Up Down
Arpeggiate, notes sorted by input order, range 4 octaves, direction up & down

8: Order 4 Oct Up
Arpeggiate, notes sorted by input order, range 4 octaves, direction up

9: Order 3 Oct Up
Arpeggiate, notes sorted by input order, range 3 octaves, direction up

10: Order 2 Oct Up
Arpeggiate, notes sorted by input order, range 2 octaves, direction up

11: Order 1 Oct Up
Arpeggiate, notes sorted by input order, range 1 octaves, direction up

Randomized presets:

12: Rand 3 Oct Up Down
Arpeggiate, notes sorted by random function, range 3 octaves,
direction up &   down

13: Rand 1 Oct Up
Arpeggiate, notes sorted by random function, range 1 octave,
direction up

Step modes:
These were adopted from the former OP-X arpeggiator, but made easier
handlable with switchable hold, steps number range from 1 to 8 and optional
single or double note repreat for all step numbers. The stepped mode is only
active when hold is switched on („ARP ON" red). The number of steps in hold
mode is limited then by the setting of the „Stp" (Speed below) knob on the left
side of the number display. The current number of steps is showed in the
display while clicking on the „Stp" knob.

Steps mode is similar to the step sequencer mode, but playback is always on.
Entered notes are written into the step sequencer's memory places in circular
mode (one step after another, returning to the first one after the last one). The
number of played back steps is being limited by the „Stp" knob. Range is from
1 to 8. The sequencer's memory places are free by default, so they have to be
filled before the maximum number of steps is blayed back. If the number of
steps is being reduced, the upper notes wil be cropped (but they stay in the
memory). This steps mode e.g. can be interesting if you want to have a fixed
amount of used notes in an arpeggio to fit a specific metre without the risk to
leave the groove by playing too many notes in a chord. But it can also be
interesting for one-finger „freehand" playing and interesting new lines.

Now the three available step modes (be sure to read the introduction about the step modes on the previous page):

14: Steps Rep 2
 Steps mode (read introduction on prevoius page);
 The steps are played back upwards and downwards repeatedly, plus the steps at the extreme positions are repeated.
 The steps mode is only active when hold is on („ARP ON"); The number of steps can be set with the „Stp" (Speed) button on the left

15: Steps Rep 1
 Steps mode (read introduction on prevoius page);
 The steps are played back upwards; the first step is being repeated;
 (with „Stp" set to 7 this is the original OP-X mode at maximum steps setting)
 The steps mode is only active when hold is on („ARP ON"); The number of steps can be set with the „Stp" (Speed) button on the left

16: Steps
 Steps mode (read introduction on prevoius page);
 The steps are played back upwards;
 This is the way the original OP-X arpeggiator used to work from steps 2 - 6;
 (for step 7 take mode .15 with steps set to 7)
 The steps mode is only active when hold is on („ARP ON"); The number of steps can be set with the „Stp" (Speed) button on the left

If hold is not active all three step modes will behave the same as mode 11 (Order 1 Oct up).

Final thoughts on the Arpeggiator/MIDI-Processor:

You will see once you have learned in which mode you find the controls for what it's a breeze to use. The sequence of modes has been arranged to get as smooth morphing between the modes as possible (that's why the octave range is rising and falling rather than always beginning from one while switching through the modes). Often used presets, first of all the double mode, are placed at the extreme positions, so you can access them in any situation in a very short time without precise tweaking (for Double mode: just turn the modes knob fully left and activate „ARP ON", then you're there already).

Also give polyphony a thought. In most cases there's no use to switch on more voices than six, especially when the release phase is cropped anyway. for some stuff however extended polyphony can be useful.

If you are in six-voice mode, you almost have a six-step sequencer with controls for each of the six steps. E.g. you can set then the filters individually in detuned mode with the white trimpots on the left. Also experiment with oscillator detuning, the „Spread" function, the pan settings and the pan modulation which can make your sequence pretty animated.
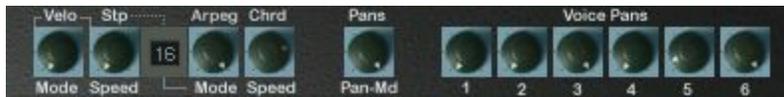
P-Md

This knob replaces the X-Md knob of the OP-X which has moved into the oscillators section. This knob allows you to modulate the voice pans of each voice. In standard mode the modulation source is the sine wave of the main LFO. If „Wheel LFO" (see page 20) is activated the source is the wheel LFO for independent treatment. Although all pans are modulated by the same LFO, the effect is independend for each voice and is determined by its individual pan setting. The pan will be modulated from the present pan setting to the opposite pan side to the same maximum amount as the original side - like a mirror, reflected at the 12 o'clock setting. So if the voice pan is set to 12 o'clock itself the pan modulation will have no effect. If the pan is in minimum or maximum setting the modulation will have the maximum effect. The direction is always determined by the „start" position, so the modulation directions can be opposite for each voice. This gives you tremendous possibilities that go beyond the already great „fixed" individual panning option. Examples:
1. All pans set to full left: this will result in a classic panning tremolo effect
2. Alternately left / right setting (the best not full) for each voice: this will result in a lively and slightly moving stereo impression; this will even improve if some pans are set to 12 o'clock or if each pan is slightly different.

Turning the P-Md knob from zero (manual and fixed panning) to right there will be a point of „kicking in" of the effect. From this point on the modulation depth is increased. For „normal" and manual pan setting this knob must be set to zero. So set this knob back to full zero for normal (manual) panning.

The voice pans:

This was a very popular feature in old analog synths. In contrast to many old synths, the controls can be accessed on the interface and also can be stored with the preset. The panpots also can be automated. In the original devices, these pots sat on a board in the inside of the case. For non modulated manual setting the P-Md knob on the left has to be set to zero (section see above). The second bank voices (voices 7 to 12) share their output channels with the corresponding voices of the first bank, so they also share the pan setting:

1 Pan setting for voice 1 and 7

2 Pan setting for voice 2 and 8

3 Pan setting for voice 3 and 9

4 Pan setting for voice 4 and 10

5 Pan setting for voice 5 and 11

6 Pan setting for voice 6 and 12
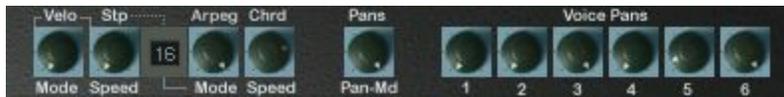
One-click-calibration:

For immediate handling or checking out various pan settings on the fly, e.g. during a running arpeggio, there's now the possibility to calibrate all six pan controls by single mouseclicks on defined areas. Presets:

Mono
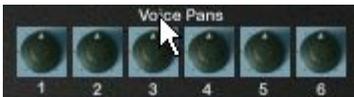
Click on „Voice" to reset all pan controls to perfect mono. This is maybe the most useful preset since setting all pans to mono one after another if needed can be annoying.

Variable Stereo
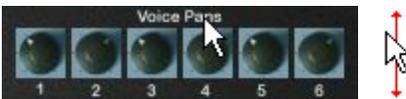
Click on „Pans" and drag the mouse vertically up or down to spread all controls at the same time continuously to stereo, both directions allowed. This can be useful to check out variable stereo with in a preset.

Preset 1: Standard Stereo
Click on „1" to calibrate the controls to an often used stereo setting

Preset 2: All Pans Left
Click on „2" to set all pans to full left. Can be useful in combination with panning modulation to achieve a tremolo-like effect.

Preset 3: Experimental 1
Click on „3" to calibrate the controls to this experimental setting

Preset 4: Experimental 2
Click on „4" to calibrate the controls to this experimental setting

Preset 5: Left to right
Click on „5". Lets arpeggios move from left to right in the stereo field

Preset 6: Alternating
Click on „6". Lets arpeggios continuously travel between left and right

Despite this comfortable calibration options don't forget that not absolutely symmetric setings as resulting by manual tweaking is still much more suitable for lively and organic sounding patches. So don't just use these presets.

The LEVERS section

The levers section contains several global controls, including keyboard animation, polyphony setting, pitch and modulation levers with dedicated controls, midi learn plus the octave setting.

Lets's check the available controls in this section:
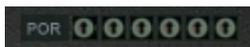
POR
Portamento tuning trimpots

OP-X PRO-II handles portamento for each voice separatly, as real vintage hardware did. So the portamento times can be different for each voice. In old analog synths the portamento times almost always were differing slightly from voice to voice which resulted in a rich and „smeary" portamento, especially in stacked unison mode. While this effect is subtle when using short portamento times (but nevertheless makes a huge difference) it gets very obvious when the portamento time is increased. Some voices will „land" earlier while others follow a bit later. This was very typical for old OB synths and it's present too in OP-X PRO-II since its internal structure is almost the same.

In detuned mode (with activated Porta. DET button in the additional buttons row) the voices' individual slightly different portamento times can be tuned with these trimpots to fit your needs. Have a look at the „Tuning Trimpots" section in this manual for a short tuning tutorial.

As all other voice trimpots too, the POR trimpots now can be calibrated with a single mouseclick:

Click on „R":

The portamento times are tuned the same as in tuned mode (Porta DET not active). This is almost equally tuned, but still with a slight offset.

Click on „P": Resets the trimpots to the standard detuning.

LEVERS

A speciality of old OB series synths was that they had two vertically working levers instead of the popular wheels invented by moog. The **modulation lever** is on the left side. In the originals it only worked downwise. In OP-X PRO-II it can be moved up- and downwise. Upwise, the modulation is inverted (hearable only in a realtive time context). The **pitch lever** is on the right side. It reacts vice versa than a popular wheel. Downwise movement highers pitch, upwise movement lowers pich.

Lever automation:

The levers can be automated in OP-X PRO-II. In most cases you however simply will record it as MIDI together with the notes. If necessary you still can edit the movements in controllers edit view which normally offers lines and other tools for precise editing. If you use automation instead of recording midi data be sure not to record the midi data at the same time, otherwise both will sum up. If you should have issues with a shifted pitchbend center point then just move and release the pitch lever at the very beginning of the automation track which will set the value to the correct center point.

A
The blue square button next to „A" stands for „Animation". Its state indicates if the animation of the virtual keyboard and the voice LEDs is active. The standard setting upon instantiating the synth is activated. If you switch the button off then the keyboard animation and the voice LEDs animation won't take place anymore. This doesn't affect any of the synth's functionality. The virtual keyboard still can be played with the computer mouse, and incoming MIDI notes still are processed. Having no ongoing animation can be useful if you don't wanna be distracted by graphical animation during playing and just wanna concentrate on the sound itself. It however also can fix possible GUI freezing issues caused by lots of GUI activity when the host or the system doesn't give the plugin enough resources for it. If the GUI should freeze (note: you still can operate it then, it's just not re-drawn anymore, so you can't see what you've done) then simply close and re-open the interface and then deactivate animation. Then it won't happen anymore.

Let's go to the lower button of the two, indicated with a number on the left:

Polyphony switch

With this button the master polyphony can be switched between 6, 8 and 12 voices. This can be done on the fly while playing, even when the arpeggiator is on. This master polyphony can be refined by activating or deactivating single voices with the „mute" buttons to achieve any custom polyphony setting.

INFO FOR FORMER OP-X PRO USERS: A second bank of 6 voices has been added in PRO-II, which will be very welcome in several situations.

The second bank of six voices has the exact same structure and default detuning settings as the first bank, but all still with the much praised separate voice design.This means you have actually twelve extremely complex separate mono synths with separate signal path and slightly different sound, controlled by the same global interface and patches memory unit.

Instead of spending each of the additional six voices own controls for detuning which would have messed up the gui, had made the patches incompatible and would have got too complicated to handle we decided to combine two corresponding voices at the same time to one channel.

The LEDs of two corresponding voices always are placed one below the other which makes the general overview very easy. The two corresponding voices share the same tuning trimpots and pan control. They also have the same default detuning setting (if detuned).

Apart from being easier handlable this way there's a further advantage: When polyphony is switched to twelve (12) the exact order and setting of variable detunings while stepping through the voices remains the same, it simply will be repeated when you enter the second bank of voices, which will leave the overall sound untouched, but, due to the doubled polyphony, without note stealing. The eight (8) voice setting will activate the center voices 9 and 10 of the second bank instead of the first two. The reason for this is that this doesn't lead to a boring repetition of voice settings 1 and 2 (which would be the case otherwise because voices 1, 2 and 7, 8 share their tuning). Further polyphony settings can be achieved by deactivating single voices using the voice mutes. More about it in the „Voice mute" section in this manual.

CPU-load:

Only switch to more than 6 voices when the sound really needs it. CPU load will rise with every additional voice involved. Pads of course profitate from 12 voices, but e.g. brasses normally only need 6 or 8. Some patches even live from voice stealing and will get muddy using more than 6 voices. To emulate original analog synths 1:1 the best use their original polyphony.

Unisono:

Independent from the polyphony setting, unisono patches will always only use the first six voices. There are two reasons for this:

1. Unisono patches with twelve (24 oscillators) voices playing at the same time are too much of the good, they're simply too fat and can get muddy

2. Since the detunings of the second bank of voices can't be set independently the additional voices would not be spread into empty sections, they would simply be added to the corresponding voice causing unpleasant add-ups or clear-outs. It would also be too complicated to keep the overview over the individual settings of twelve separate voices.

So with these small compromises you have the best of two worlds: a separate voice design with detailed tuning features combined with extended polyphony which does not mess up the gereral character and sound.

Voice allocation:

The voice allocation unit is working in circular mode, which means that for every new note a new voice is triggered as it was the case in the OB series too. Because no voice sounds exactly the same (even in tuned mode) this results in a rich, lively and never stiff sound. The voice allocation is adapted on the fly when additional voices of the second voice bank become active. The notes will step through the voices beginning from the first voice of the upper bank further on to the second bank after the last voice of the upper bank. You only have to care about it when you want to tune individual voices. Have a look at the comprehensive tuning tutorial in this manual for this.

Custom polyphony settings using voice mute:

Since the voice mute buttons now not only mute a voice (or more precisely: a voice-pair, namely the two belonging to the same channel) but also comletely deactivate it, you now can use the voice mute buttons to set up any custom polyphony setting with any voices of choice you want to have involved. The voice distributor will allocate incoming notes only to the currently active voices, and still always in rotating mode, with the resulting cpu drop. Read more about it in the „voice mute" section in this manual.

Os2

Oscillator 2 only. When switched on, the pitchwheel (or whatever it is called) does change the pitch of oscillator 2 only. This is great for controlling sync or fm sounds. Try the preset "SyncSolo" to explore this.

2-12

This button serves for setting the pitchwheel interval. PRO-II offers now a wide range of possible intervals and further pitchwheel / modwheel functions. There are two ways of switching the interval:

- clicking on the blue led button switches between the two standard modes 2 semitones and one octave. This can be done on the fly as usual.

- clicking into the small number display just above the button and dragging the mouse vertically up and down gives access to a wide range of other intervals, interval combinations and modwheel functions. In live application you could directly access dedicated modes by sending suitable CC values.

2	2 semitones up / dn	8	8 semitones up / dn	1:	1 semitone down 2 semitiones up	:.	1 octave up / dn modwheel to filter
1	1 semitone up / dn	9	9 semitones up / dn	.1	1 octave down 1 semitione up	:;1	2 dn / 1 up modwheel to filter
2	2 semitones up / dn	10	10 semitones up / dn	.2	1 octave down 2 semitiones up	i1:	1 dn / 2 up modwheel to filter
3	3 semitones up / dn	11	11 semitones up / dn	1.	1 semitone down 1 octave up	i.:	1 oct dn / 2 st up modwheel to filter
4	4 semitones up / dn	:12	2 octaves up / dn	2.	2 semitones down 1 octave up	ii2	p-wheel dn to vib, 2 st up, mod to filter
5	5 semitones up / dn	:12	3 octaves up / dn	i1	1 semitone up / dn modwheel to filter	.1i	1 oct dn, 1 st up, mod 2 st up
6	6 semitones up / dn	ii12	4 octaves up / dn	i2	2 semitones up / dn modwheel to filter	1.i	1 st dn, 1 oct up, mod 2 st up
7	7 semitones up / dn	:1	2 semitones down 1 semitione up	i7	7 semitones up / dn modwheel to filter	12	1 octave up / dn

Oct.

Switches the octave. It will affect key tracking, so better use the octave transpose function of your midi keyboard to shift the accessible octave range.

Tuning Trimpots
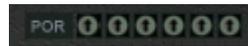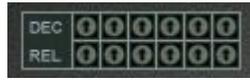
This section will make you familiar with the handling of the virtual tuning trimpots in OP-X PRO-II.

In real vintage voltage controlled synths similar tuning trimpots could be found on the voice boards in the inside of the devices. They had to be tuned from time to time by a service technician or the experienced musician. The goal of this procedure was to make all voices sound identical. From the todays' point of view the slight imperfectness and differences in sound between the voices, caused by device tolerances and aging processes, gave these old analog synths the organic, rich and lively character that got lost a bit in newer synths using digitally controlled voltages.

These fixed slight differences furthermore were overlapped by the warming up drift which normally became stable after some minutes.

For some sounds these slight detunings were great, especially for pads and slow sweeps, but also for stacked solo sounds which sound way more rich and smooth if not only the oscillators but also the filters, the envelopes and the portamento times are spread a bit - you can check this out in OP-X PRO-II to hear the difference. For other sounds however these detunings were annoying, especially for fm (which needs absolutely equal tuning for chromatic playing) and snappy brass sounds which need precise settings. So in the past there was no other way than changing the synth for these different tonal characters since a full tuning was a very time-consuming process.

In OP-X PRO-II you have all of this too, but with total immediate control, one fingertip tuning and saving option. So every preset can sound like a different synth in fact, with variable age or service state.

The consequence of this is that OP-X PRO-II really feels and sounds like real hardware and can also be tuned like the old glorious analog synths.

The detuning options are split up into four independent sections that can be individually tuned or detuned: oscillators (common for osc1 and osc2), filters (cutoff), filter envelopes (decay and release times) and portamento times.

Each of these sections can be individually tuned or detuned, either just on/off, or now too seamlessly to achieve any state between tuned and detuned by clicking into the text labels of the dedicated buttons and dragging the mouse vertically. All this can be done in the MANUAL section (OSC/FILT/ENV) and the additional buttons section (Porta. DET). In detuned mode the tuning is represented by the settings of the dedicated trimpots (one per voice channel), in tuned mode these have no effect anymore. It's important to know that the standard 12 o'clock setting of the trimpots doesn't mean tuned - this setting represents the standard detuning implemented by SonicProjects.

In OP-X PRO-II you now have the possibility to edit these detunings to your liking. If you e.g. feel that the filter of one voice opens a bit to wide for your taste you can tweak it down a bit. The detuning settings will be saved with the current patch and have no global effect. That means every patch can have its own individual complex detuning setting.

The buttons to switch the sections from tuned to detuned mode:

Oscillators, filters and filter envelopes:

In released mode the sections are in detuned mode, in pushed mode (led shining) the sections are tuned and will override the trimpot settings

Portamento times:

This button does react vice versa: in pushed mode the portamento times are detuned (trimpots setting), in released mode the times are tuned and will override the trimpot settings.

In pushed (=detuned) mode you will get that famous smeary portamento sound from the old days which gives a special depth.

Continuous detunig:

There's now too the possibility to seamlessly choose any state of detuning between completely detuned and tuned for each of the four sections individually. This can be done by clicking into the text labels just above the involved button and drag the mouse vertically up or down. A blue popping up display will show the current value. OSC, FILT and ENV share a common three value display while „Porta DET" has a separate display in the filters section (which is also used to show oscillators and noise levels):
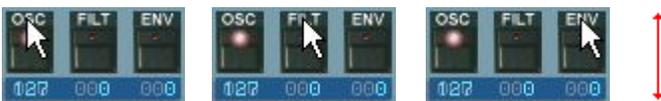
Tuning Tutorial

The following section will make you familiar with the tuning procedure for each of the four sections. In fact a full tuning is never necessary since you can tune the sections with a single mouse-click using the tune-buttons described above or using quick-calibration. But it will help you to understand the functionality of the trimpots so that you can make the best use of them.

Filter trimpots:
Most important and probably really used sometimes for immediate tweaking or experimental sequencer lines. In monophonic mode (only one voice active) the trimpots also can be used for very detailed cutoff control.

Env trimpots:
Probably not used most of the time, but very useful if one voice sweeps down a bit too slow for your taste in a dedicated patch.

Portamento trimpots:
Only for real cracks that want to copy their hardware devices 1:1.

All three trimpot sections offer now one-click quick calibration, which allows to set all voice trimpots to equally tuned mode or again back to the standard detuning (which is 12 o'clock for all trimpots).

Quick-calibrate the filters:

Calibrate to equally tuned: Click into the area on the right of the trimpots.
Reset to standard detuning: Click into the area on the left of the trimpots.

Quick-calibrate the filter envelopes:

Click on „C": Calibrates all „DEC" trimpots to equal times (same as tuned)
Click on „D" to reset all „DEC" trimpots again to the standard detuning.

The same for REL with „L" and „C":

Quick-calibrate the portamento times:

Smililar: „R" tuned, „P" back to the standard detuning.Click on „R".

Oscillators tuning

There are no trimpots to tune the oscillators. The reason for this is that the detuning can be controlled continuously using the spread knob which also works in polyphonic mode. Also pitch would be hard to control with trims.

There are several ways to control pitch detuning:

1. OSC tune button released, spread set to zero. In this state OP-X PRO-II sounds like a hardware device after switching on before applying autotune. Sounds real dirty. Seamless detune: click on OSC and drag the mouse.

2. OSC tune button pushed, spread set to zero. This is the fully tuned mode, good for polyphonic sounds that should be 100% purely tempered.

3. OSC tune button pushed, spread set to a variable amount. In this setting the spread knob gives you continuous control from fully tuned (zero) to detuned. You can make polyphonic sounds slightly impure (do it!) like this and fatten up stacked unisono sounds. Sounds similar to warm-up drift.

4. Last but not least you can even mix spread and button detune with not always predictable result.

A further thought went to the relative detunings between oscillator 1 and 2 for each voice. The „normal" way to handle this is the OSC2 Detune (OSc2 Det.) knob in the CONTROL section.

The detuning of oscillator 2 will produce beats with increasing frequency from zero to max position that will fatten up the sound and make it lively.

While in softsynths the zero setting theoretically really allows for absolutely equal tuning this was almost impossible with VCOs. There always were slow beats left even in „equally tuned" position, caused by temperature drifts and the fact that no voice had the exact same zero point.

To emulate this in OP-X PRO-II turn the small white trimpot below the „OSC2 DET" knob to max position. In this position there will be very slow beats left even when the osc2 det knob is set to zero. The frequency of these beats also slightly vary from voice to voice like in real VCO synths. When this trimpot is set to zero you can emulate a DCO synth. In absolutely equally tuned mode (trimpot and „osc2 det" set to zero) there nevertheless will be different relative phase settings between osc1 and 2 for each voice which are random and will have an influence on the sound. For asolutely even phase tuning you have to depress the „SYNC" button in the oscillators section additionally.

Filters tuning
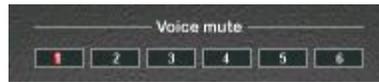
Slightly different cutoff settings for each voice can result in a more lively and rich sound for both pads and stacked unisono sounds. In released FILT tune button mode, the filter settings of OP-X PRO-II vary slightly from voice to voice by default. This standard detuning corresponds to the 12 o'clock setting of the FILT trimpots. So 12 o'clock setting does not mean tuned.

To hear the filter settings of each voice set the resonance to a high level and reduce the cutoff to about 13 o'clock. You will hear the filter resonance „sing" now, and stepping through the voices (playing repeated notes) will result in a little „melody". With self oscillation switched on you will hear it the best. Which voice is presently playing you can see looking at the voice LEDs. The trimpots correspond to voices one to six from left to right in the upper bank and at the same time to voices seven to twelve in the lower bank. So you do your settings always on a six voice base which will repeat itself in the lower bank of voices which can be activated/added on demand for extended polyphony. Tweak the trimpots on the fly to change the „melody" or stop repeating notes and hold one note and then tweak the dedicated trimpot.

If you want to know how much the detuned mode differs from the tuned one for each voice you just have to push and release again the FILT tune button while holding a note. While switching forth and back between detuned to tuned mode you can alter the voice's trimpot until the tuning is tuned and detuned mode is equal. Then you can see the offset difference.

This can be done even more comfortably without stepping through the voices and stopping when you activate the unisono mode (which will play all voices at the same time) and then mute all voices exept the one you want to tune.

If you want to act as a service technician of the old analog days then take the challenge to tune all filters from voice one to six like this. Once tuned you can set up your own individual filters' detuning. Don't forget to save it with the current patch since this won't have a global effect.

If you want to exactly copy the sound of your old 6-voice hardware synth (e.g. XPander or six voice OB-X / OB-Xa / Prophet 5 etc.) including all detunings then you simply have to exactly match the settings from voice to voice from the hardware device to OP-X PRO-II. So you will have to set your hardware synth to the same resonance and cutoff setting as OP-X PRO-II before tweaking the trimpots of OP-X PRO-II. You can save the patch then as a root patch for a dedicated synth sound. It's all up to your fantasy in fact.

After successful tuning the trimpots will look like this:

Envelopes tuning

Slightly different decay and release times in the filter envelopes of each voice can give long downsweeps a more organic and lively character. Unisono downsweeps with detuned times are broader, fatter and richer as it would be with absolutely equal times. These slight detunings were very typical of old polyphonic analog synths and can be heard going on in in many famous sounds.

However there are sounds where these differences are unwished or even disturbing - e.g. brass. So the detunings can be switched off at the touch of a button (ENV in the MANUAL section).

OP-X PRO-II furthermore lets you alter the implemented standard detuning to your liking - should this be to copy a particular sound in every detail or to copy the behaviour of an existing real analog synth. The standard detuning corresponds to the 12 o'clock setting of the ENV trimpots, again on a six voice base which repeats itself in the lower bank of voices. So 12 o'clock setting means not tuned. The trimpots setting will only have an effect when the ENV tune button is released or partly blended into detuned state.

The meaning of the abbreviations:
DEC: Decay - tunes the decay time of the voice's filter envelope
REL: Release - tunes the release time of the voice's filter envelope

If you want to tune the envelopes you do it the best always comparing one envelope to a reference one. First release the ENV tune button in the MANUAL section to get in detuned mode. Switch to unisono mode then and mute all voices exept your chosen reference voice and the one you want to compare to it. Set the resonance to a high level, set cutoff to zero and env amount to max. In the envelopes section set the filter envelope attack and sustain to zero, the amp envelope attack to zero too and the sustain and decay to max. If you want to tune the release times you also have to set the amp release to max. Then you can e.g. take decay 1 as a reference point and compare a chosen voice to it. Then tweak the decay or release trimpot of the voice you want to tune. You will clearly hear when the two voices close in the same speed. The tuning is always done on a six voice base which will repeat itself in the lower bank of voices.
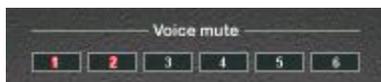
After full tuning procedure your trimpots will look like this:

Portamento tuning

Although it was not an intention actually the portamento times of old voltage controlled analog synths always differed a bit from voice to voice. This results in kind of a „smeary" glide sound in stacked unisono patches which is very charming and was very typical. Using extremely long portamento times this also had an effect in polyphonic sweeps over several octaves - some voices did „land" earlier and others „went home" later - also very typical.

You can activate this effect with the „Porta. DET" button in the additional buttons row. In released state the portamento times of all voices are equally tuned. If the button is pushed the portamento times differ a bit from voice to voice - just as it is the case in the real world. This standard detuning setting is represented by the 12 o'clock setting of the POR tune trimpots - so 12 o'clock means not tuned.

The trimpots allow you to alter these times to your liking - may it be to copy your favourite sound or an existing hardware synth in all its individual detailed behaviour.

In most cases however the standard setting will be perfectly usable since it's adjusted to copy some well known sounds.

If you nevertheless really want to tune the portamento times by yourself you do this the best again in unisono mode always comparing two voices to each other (one as reference point). If the two times are equal the glide won't "smear" any more.

To choose the right reference point it might help to know how the trimpots would look if they were equally tuned to the tuned mode:

So it's recommended to take voice 5 as reference point since this one is as well as not detuned. This will leave enough scope of action for tweaking the trimpots. Remember that the tuning is always done on a six voice base which will repeat itself in the lower bank of voices which only will get involved when extended polyphony is switched on.

Final note:
If you should have missed to read the introduction of this tuning tutorial or the individual sections of the trimpot groups in this manual it may be mentioned once more at this place that the tuning trimpots too can be calibrated by single mouseclicks now. Read more in the dedicated sections.

CREATE YOUR OWN SOUNDS AND BANKS

The patch browser of OP-X PRO-II makes it very easy to create and save own new sounds, and collect them in new custom banks which you e.g. can use as custom soundset for your live performances, so that you just have to toggle forward programs to have the sound for the next song or the next playing part ready. Banks also are convenient to group presets by themes as we did it in the banks library, and banks also allow for fastly browse through presets and for switching presets remotely controlled by MIDI CC (see page 85). A bank always can have 128 presets. For more infos read page 9 ff.

INFO FOR FORMER OP-X PRO USERS: Of course you still could handle patches as you're used to with your vst host, but you will quickly see that it's much more comfortable to do this using the integrated patch browser. The synth's own presets furthermore are host-independent. The patch browser loads and saves all presets and banks to the same central location by default, which means you don't have to browse around to find your banks and presets, they're always directly accessible. The default path only will be changed when you browse for files elsewhere, e.g. when you've created own sub-folders within the root one (which is allowed). But the default path will be re-set when the plugin is closed and launched again. Read more about the patch browser in the dedicated section (Top Bar -> Patch Browser).

How to create own new banks of selected or edited presets:

1. Save single presets

First of all you have to save the single presets you want to put into the new bank, which can be unedited factory presets, or edited ones / own new creations. If you've created a new preset / edited a one then it's highly recommended to give it a new unique name in the text field for easy recall before you save it. You may deactivate „always on top" for the plugin window if your sequencer reacts to character shortcuts in writing mode. The file name by default ist the same as the preset name specified in the name field which allows for easy and fast saving without the need to edit file names first. This is allowed of course, but be aware that the file name can be different than the displayed preset name, they are not linked. So it's recommended to just click PRESET:SAVE and ok, which is very fast and easy.

2. Load the empty bank and load the single presets into it

There's a bank called „PROII_EMPTY" which is dedicated for creating own new banks. All locations are labeled „empty" with all controls set to produce no sound. Now load the before saved presets in any order you like into the preset slots of the empty bank, by before selecting the location to load into (using << >> or the list), and load in a preset of choice using PRESET:LOAD. Repeat this step for each preset you want to load into the bank.

3. Save the bank with a custom name. Use BANK:SAVE for this. To keep things clean you could save your own banks to a dedicated subfolder.

TIPS AND TRICKS

Some collected experience-based tips and tricks that we'd like to share to help you to make the best possible use of the synth:

Fine tuning of button parameters

While many button-based parameters are only two state on the gui, they are in fact continuous inside the engine. This allows to fine tune them using vst automation or midi cc and you can also save this setting with the preset. Some selected parameters also allow for fine tuning directly on the GUI by clicking into the white text label just above the button and drag the mouse vertically up or dow. A small popup display will indicate the current value ranging from 0 to 127 then. This can be done with: All detuning buttons (OSC/FILT/ENV/Porta DET), main oscillator and noise levels (OSC1 ON, OSC2 FULL, NOISE FULL). This e.g. allows for continuous mixing of the oscillators and noise to the filter instead of just off/half/full. If you e.g. only want to have a tad bit of noise then deactivate NOISE HALF, click into the FULL label of the noise full button and drag the mouse vertically up until it fits. The knob state on the gui only will change when the fifty percent amount is surpassed. This of course also allows for continous automation or cc control of a two-state parameter.

Using ring modulation for more presence and dirt

Apart from the „normal" application the ring modulation feature can be used to give a sound just a tad bit more presence and dirt. Just set the x-mod amout trimpot to its minimum level (or a very small amount) and activate ring modulation. Carefully increase the amount for a little bit more effect (but still just a tad bit). Apart from the multiple detuning features this is another tool for subtle manipulation of the tone.

Explore the additional banks

Although the default factory bank is a collection of some of the best and most useful sounds from all categories, all carefully selected in a time consuming selection process, it's highly recommended to take the time to check out too all the many (66) additional banks which are delivered with the synth and can be loaded with BANK:LOAD. OP-X PRO-II is able to produce an incredibly wide palette of sounds, probably more than you would suppose. It can sound like a Jupiter-8, Prophet 5, Synthex, SH-2000, Minimoog - just check the dedicated banks. Check the „Famous" bank if you are out for all those famous 80ies sounds. The library at this time offers a total of 66 banks including more than 2'500 sounds. The „Presetbase" included in the 1.2 installer includes the 32 original factory banks as well as all banks released on the sound reloads page (see link below - these banks can be found in the subfolder „Downloaded") so far, as well as some extra banks (in „Extrabanks"). If you're a former OP-X or OP-X PRO or OP-X PLAYER user you even can download all original banks in converted format (see „Former OP-X PRO libary") on the sound reloads page, which also in the future will be updated with new free reloads:
http://www.sonicprojects.ch/opxpro2/userarea.html

Using the filter trimpots for animated sequencer lines

Apart for subtle manipulation of polyphonic and stacked unisono sounds, the filter trimpots can be „abused" to fine adjust the cutoff settings of each of the involved steps individually while using the sequencer mode (arp on pushed to red). Lower the main cutoff, rise resonance, release the „FILT" button in the tuner section and play around with the trimpots. You will be able to produce exciting animated sequencer lines with this trick.

Using the detuning features to fine tune sounds

The multiple detuning features are one of the most powerful tools of OP-X PRO-II if you learn to use them. You won't find these in this form in another synth. They allow the synth to sound lively, organic, natural and smooth - just like a real analog polysynth. So it's highly recommended to take some time to really get to know and understand these features. Once understood you will begin to use them intuitively on the fly, and you will ask yourself how you could live without them before.

We've set up a dedicated website that tries to describe the strenghts and use of the separate voice design (SVD) with a lot of illustrating audio clips:

http://www.sonicprojects.ch/obx/separatevoicedesign.html

Remember the detuning features cover four parameter groups:

- oscillator frequencies
- filter cutoffs
- filter envelope times
- portamento times

A short summary (details on the website above) of possible situations where sounds benefit from the separate voice design with its slighly different (and tunable) settings for each of the six voices:

Sweeps:
Slighly different rising and falling times of the filter envelopes for each voice make the sound more lively and organic.

Pads:
Slighly different cutoff settings and a tad bit detuned (using spread) oscillators make the sound more analog, lively and characterful

Solos:
High resonant stacked solo sounds sound much more gentle and less stiff with spread cutoffs. Otherwise they can sum up and sound stiff.

Portamento:
Detuned portamento times give that famous „smear" known from old analog unisono sounds and real analog feel in polyphonic use.

Compatibility to the 6-voice OP-X PRO

OP-X PRO-II version 1.2 isn't directly compatible to OP-X PRO anymore (and also no to OP-X PRO-II version 1.1) since it uses a new self-contained patch format not anymore based on fxb (new format: .opxpreset and .opxbank). We however offer dedicated transfer plugins (check your user area) which are compatible to the former OP-X PRO fxb banks and fxp patches. So you can transfer your custom former OP-X PRO banks to the new OP-X PRO-II version 1.2 patch format. You should get the exact same sound as before in OP-X PRO-II, of course with the possibility to refine the patch with the new additional features.

The exeption is the arpeggiator whose settings does not translate to the same behaviour because it has been completely rewritten for OP-X PRO-II. However the „old" modes are there as preset in the new one - it's the presets 16 (Steps) and 15 (Steps Rep 1) with activated hold. Have a look at the arpeggiator section for more details. Effects parameters always are zero.

There's one parameter that has to be adjusted in some special situations: it's the pitch bender (lever). The center point of this one has been shifted a tad bit in OP-X PRO-II for exact bending behaviour if the midi keyboard only sends 128 values (which actually have no exact center point). In normal situations this can't be perceived at all, but if the pitch lever interval (2-12) is one octave (imported from 6-voice version) and the „Os2" (pitch lever to oscillator 2 only) is on, the tiny detuning can be perceived because of slightly different beats between oscillator 1 and 2 (example: „Floyd Signs Of Life Pad"). But it's easy to fix: simply move the pich lever and let it return to the center position (either directly on the GUI or with your midi keyboard) and re-save the patch. The center pont will be correct now.

Program change

Patch changes in synths sometimes can be „clicky" because of the abrupt change of many parameters, producing ugly audible artefacts like clicks or pops, which especially in a live situation is a bad thing. That's why we built in a sophisticated patch change smoother which removes these artefacts when the patch is changed by midi program change (p. 85) or with the patch browser's incremenr/decrement buttons. The master volume and amp release are fastly faded out and in again then on program change and active notes are released. The program change itself is slightly delayed so that it's placed exactly into the zero point. Program changes are completely smooth and inaudible then which is great for live use. So for the smoothest experience switch patches using MIDI CC program change (see p. 85) or with << >>.

Using the SPREAD knob

It's important to know that the spread knob also works in polyphonic mode. It can be used then to give polyphonic patches a tad bit of impure tuning for analog feel. In double mode (more about it below) it can be used to detune the single notes of the note pairs to each other which will result in a fat and lively sound with added beats.

Using the Double mode

The double mode is another way to make use of the extended 12-voice polyphony. It's an extremely interesting feature to make sounds even fatter and more lively as they already are while keeping at least six-voice polyphony. Double mode will trigger two neighbouring voices on one midi note. Due to the separate voice design the two notes will only sound (at least almoust) exactly the same if all detunings are deactivated. So double mode does result in a fattened up sound that even can be tweaked (more below).

To activate double mode just turn the arpeggiator mode knob (the one on the right sind of the number display) fully anti-clockwise (number will be .1) and activate „ARP ON" (led orange).

We've chosen the extreme mode position that double mode can be accessed fastly in any situation because it will be used or at least checked quite often once you've discovered it.

If the „ARP ON" button is pushed a second time the LED will turn into red and the double notes are arpeggiated (speed and mode on the left now). Read more about it in the dedicated section of this manual.

Once activated you can play now with the „SPREAD" knob which - because it works also in polyphonic mode - will detune the two notes to each other and cause beats. The more the SPREAD knob is being turned clock-wise the fatter the sound will get with increasing beats going on.

You will see that this feature easily can lead to obsession. Once discovered you will probably want to fatten up every single sound with it. But after a while you will see that it's not good in any situation - the fatter a sound is the more difficult it is too to mix. A slim and simple sound can be way more effective in many situations. So be careful with this feature and look at it as a further option for situations or sounds that really profitate from it.

Remotely controlled arpeggio hold with the damper pedal:

There's quite a handy feature which allows for activating and deactivating arpeggio hold remotely controlled with the damper pedal. Just quickly depress and again release the damper pedal within less than half a second in arpeggio mode. Then hold will be activated. If you're in normal arpeggio mode, the „ARP ON" button LED will turn deep red. If you're in preset chord or double arpeggio mode, the „Hold/Vel" will get active instead. You can deactivate hold again with the same action. This also can be used to start and stop playback in record mode. Due to the dependency on the operation speed you can use normal pedal driven long release (sustain) without activating hold, both in non-hold and hold mode. So you can e.g. add sustain by holding down the damper pedal during a held arpeggio. This is quite a practical feature when your hands are busy playing a cool arpeggio line and you want to „freeze" (hold) it without grabbing again the mouse or a controller button to activate hold. You'll going to love this feature once you've learned how to use it. Promised!

Parameter automation

Every single parameter of OP-X PRO-II can be automated by the sequencer. How this is done depends on the used sequencer. Example Cubase: Push the write button on top of the vst plugin window (R), start the sequencer and tweak the controls you want to automate. To recall the written data jump back to the start, push the read button on top (R) and start the sequencer. For precise automation you however better draw and edit automation curves directly in the arragement window below the instrument track using lines and points.

In AU hosts manual automation by tweaking knobs and buttons directly on the interface of OP-X PRO-II may not work. In this case switch „View" in the top left from „Cocoa View" (this is the graphical interface) to „Controls" (which only lists the parameters as faders in generic view), then it will work. Of course you can edit automation directly in the arragement window instead.

You may ask yourself what the MIDI CC 0 - 129 parameters are for. These are used to connect MIDI CC to the plugin. Do not use these.

MIDI CC Implementation

OP-X PRO-II lets you remotely control almost all parameters using Midi Continuous Controller Data (Midi CC). This is normally handled by a midi keyboard featuring built-in knobs or by a separate controller device.

Changes in version 1.2 compared to 1.1:

There's no default midi mapping anymore, which helps to avoid unwanted parameter changes by incoming controller streams. In comparison to before you now can learn almost ALL controls including the filter trimpots and the effect section controls, with the exception of the small grey env / por trimpots. But these are used very rarely anyway, and if not for real-time control.

Since the new cross-platform version is built around the VST3 SDK which offers no MIDI program change support direct MIDI program changes aren't supported. But to compensate this shortcoming we implemented 4 really great ways to initiate program changes via MIDI CC controllers. You can perform program changes by rotary knobs, by preparing a program change number and then send it on demand, by before converting standard MIDI program changes to CC (must be done in your host) and then treat it like a standard program change, and you even can remotely control the increment/decrement buttons by MIDI CC now, which all offers a fantastic on the fly control! Read more about it on page 85 ff.

The same as in the previous version OP-X PRO-II offers a MIDI CC processor which allows for relative or fetched CC response for completely value-jump-free operation. This is very unique amongst vst plugins.

This all gives you fantastic possibilities to completely remotely handle and control OP-X PRO-II as if it was a hardware synth.

MIDI Learn

Except for the small grey env / port trimpots you can learn all controls to an external controller (now also including the white filter tuning trimpots and the effects section controls). The buttons for this are the ones below LEARN in the grey top bar, so „LEA" for learn and „RES" for reset.

Learn a control on OP-X PRO-II to an external controller:

1. Click on the LEA button below LEARN in the top bar.

Next to „A" in the levers section a blue popup will appear reading „CC learn..." indicating learn is waiting for your input.
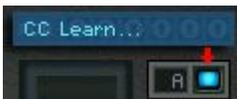
2. Move the control on OP-X PRO that you want to learn to a new controller.
3. Move the controller on your controller device which you want to learn to it.

The popup menu will disappear now which means: learning successfully completed. The control is now linked to the external controller.

It also works the other way round, so moving the controller on your controller device first and then the one on the synth.

You can also leave the learn mode without doing anything by clicking a second time on the blue square button. The popup will disappear then without having changed anything.

Reset one learned control (new in 1.2):

1. Click on the LEA button below LEARN.

2. Move the knob/button on the synth's GUI you want to unlearn.

3. Click on the RES button below LEARN.

The control is unlearned now and won't react anymore to controllers.

1. Click and hold the RES button below LEARN

Next to „A" in the levers section a blue popup will appear reading „CC reset..." indicating you're about to perform a full reset.

2. Keep „RES" or „A" depressed for about 4 seconds until the blue led turns red for a short time.

Reset is completed now. You can release „RES" or „A" now. The time delay is a protection against unwanted resetting by accidentally clicking the buttons.

Program change learn features:

See next page.

NOTES:

You can learn as many controls as you like, one after another. Of course, since you only can use the 128 standard controllers and no NRPN for learning the maximum number is limited to 128, minus 0 (blocked), 1 (mapped fixed to modulation) and 64 (mapped fixed to damper pedal). These can't be changed or unlearned.

Where are my settings saved to?

The complete setting will be saved to a text file called „Controllers.txt", in Mac in /Users/Shared/SonicProjects/OP-X PRO-II and in windows computer in C:\Users\Public\Documents\SonicProjects\OP-X PRO-II and so will stay persistent even after closing the plugin. Technically seen you even could make a backup copy of this assignment file.

Like this you theoretically could prepare several different mappings and backup these as separate files, and place them if needed. The file however must be named Controllers.txt, otherwise it won't be recognized.

Program change learn features:

Since the version 1.2 engine is built around the VST3 SDK which doesn't support MIDI program change direct MIDI program change also isn't possible.

To compensate this shortcoming we however implemented a bunch of very sophisticated ways to remotely switch programs using standard MIDI CC controllers. If your host offers MIDI message transform function you even could get back the former standard program change by transforming program change messages to MIDI CC before and use the dedicated mode.

These are the modes:

Remote program change via rotary knob / fader

This will allow you to set a program number of choice by turning a hardware knob or fader. The program change only will be sent 0.5 seconds after you stopped moving the knob.

This on one hand is a protection for a flood of multiple serial program changes and on the other hand gives you time to scroll through the numbers (displayed on your controller device) and only release it once you're on the CC value you finally want to send as program change.

To learn a hardware knob or fader for this function do the following:

1. Click on the LEA button below LEARN

2. Move the knob or fader on your controller device you want to use for this

3. Click into the program number field

Done!

Now turn the knob or move the fader and release it at the CC value (displayed in your controller's display) you want to set the program number to and release it. The program in the loaded bank now will jump to this program.

Note since CC values are 0 - 127 and program numbers in OP-X PRO-II are 1 - 128 0 will result in 1, 1 in 2, etc.

To unllearn the knob/fader again click on LEA, click into the program number field, and then click on RES.

Remote program change by increment / decrement

In order to remotely controlled toggle forth or back in the programs of a loaded bank you can learn the increment (>>) and decrement (<<) buttons to external controllers. Of course the best switching feeling will result if you're using buttons for this, but if not available you also can use rotaries.

This function only detects if the learned value is being changed and then performs the increment or decrement immediatly and blocks what comes after until there 0.5 seconds of no data. So using rotaries (or also faders) it doesn't depend in which direction you turn them, so you could turn them back and forth alternatingly. But the feel and handling definitely will be better using buttons.

How to learn a button/knob/fader to increment:

1. Click on the LEA button below LEARN

2. Move/click the button, knob or fader on your controller device you want to use as program increment switch.

3. Click the increment button

Done!

To avoid unwanted program changes the switching functionality of the increment button is temporarily disabled in learn mode. Of course it will become functional again after learn is finished.

Now if you click/move the learned button/knob/fader the program will be switched one program forward. For another toggle you need to release/stop moving the button/knob/fader for at least 0.5 seconds. This is a protection for flooded program changes.

To again unlearn the increment button click on LEA, then click the increment button (>>) and then click on RES. Then it will be unmapped again.

Learning decrement:

Of course this works exactly the same. The only difference is that you need to click on the decrement (<<) button in 3. So you can learn increment and decrement to separate (the best neighboured) buttons/knobs/faders so that you can easily remotely toggle back and forth in the programs.

Remote program change by sending a prepared number

This is a further way to perform a program change. It allows you to prepare the action in advance by pre-setting the to-be-sent program number by a separate knob or fader, and then send it on demand by clicking/moving a separate button/knob/fader. This sometimes might be more convenient than moving a knob on the fly and try to „land" on the correct number.

This function uses two controls, one to set the program number that should be sent, and another to trigger the sending.

1st Step: How to learn a knob or button as program-presetter:

1. Click on the LEA button below LEARN

2. Move the knob or fader you want to use to set the number for the prepared program change.

3. Click on the „FILT" label on the middle one of the tuning buttons (CONTROL section on the left). Since this is a small area you need to be precise. In mac try to click on the very top border of the area. If the blue value display appears below you hit it correctly.

If you by mistake hit the button area below instead the knob/fader mistakingly will be learned to the tuner button itself instead. In this case again unlearn it (LEA, click on the button, and then on RES).

2nd Step: How to learn a button/knob/fader as trigger to send the change:

1. Click on the LEA button below LEARN

2. Click/move the button/fader/knob that should send the prepared program number before set by the program-presetter knob/fader.

3. Click on the „ENV" label on the right one of the tuning buttons. Be careful about the same things described in 3. in the 1st step section.

Done! Now you can set a desired number with the program-presetter knob or fader and send it on demand by clicking/moving the send button/knob/fader.

Remote program change by using a transformed program change

This is another slightly different option for switching programs. It's mainly made for combination with a MIDI message transformer in your sequencer which transforms normal MIDI program changes into a CC controller message, so that you furthermore can use normal program changes.

The difference to the first way of switching programs via knob or fader is that this one has a slightly different behaviour regarding timed blocking. While the knob method waits for sending of the program change until there has been 0.5 seconds of no messages, this one performs immediatly, but then blocks further messages until there has been at least 0.5 seconds of „silence".

This might be more convenient for normal program changes since you want to take them action immediatly. For knob or fader control this method isn't suitable since it always only would send the next neighbourded value upon turning the knob and then block. But for single prepared program change messages this works well. Of course you also could use the knob method if you don't care about the 0.5 seconds of delay.

How to learn a transormed CC (transformed from program change to MIDI CC by your sequencer) to program change:

1. Click on the LEA button below LEARN

2. Send the transformed CC which should be used for immediate old-style program change

3. Click on the „OSC" label on the left one of the tuning buttons. Be careful about the same things described on the previous pages (avoid to click the button area below instead, in Mac click the upper border, in case of learning button instead because of unprecise clicking again unlearn it).

Done!

Now you should be able to perform normal program changes using a transformed-to-CC standard MIDI program change.

PROGRAM CHANGE - FINAL NOTES:

The great thing is that all these methodes can be used in parallel. So you can set them up all and then decide on demand which one to use to perform a program change.

These methods give you fantastic options to remotely switch programs which haven't been there before despite standard program changes aren't supported because of the used SDK.

NOTE: Program changes will only work with opened GUI.

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Chapters

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Click on the control in the GUI picture you want to learn more about, and the link navigator will take you to the dedicated section in the manual: