

Synth1 Ver.1.3 Manual

2014.7.10

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Introduction to Synth1

Synth1 is a software synthesizer for computer music use. It is VST1/AU compatible. (AU version is beta now.) The current version is freeware.

Functionally it is modelled on the Clavia Nord Lead 2 **Red Synth** , with the following characteristics:

- 2 Oscillators + 1 sub Oscillator, FM modulation, ring modulation, sync, modulation envelope
- 4 types of filters, distortion
- 2 LFO (synchronized with host)
- Arpeggiator (synchronized with host)
- Tempo delay (synchronized with host), stereo chorus/flanger
- Legato mode, portamento
- 12 notes polyphony
- 128 presets
- Thoroughly optimized for light CPU load using SSE instructions etc.
- Automation

Operational Environment and I. Limitations

Windows	
Compatible CPU	The x86/x64 CPU that supports SSE2 is necessary. If it is not greatly old CPU, it is safe.
Compatible OS	Windows XP/Windows 7/Windows 8/Windows 10 (developed on Windows 7 64bit)
Compatible hosts	Host: Cubase 5/6/7/8/9/10, VST1, Cubase SX/NA, etc.
Plugins formats	VST1/2.4
Sampling Frequency	Arbitrary
I. Limitations	Not multibitral

Installation and Uninstallation

Installation

A case to use for the first time

1. You carry out setting initialization tool "insettings.exe" in the directory same as this file. Then setting is initialized.
2. The VST1 DLL is called "Synth1 VST1.dll" (32bit) / "Synth1 VST64.dll" (64bit). Copy this file to the VST1 plugin folder of the host application.
For example, if your favourite sequencer is Cubase , you should copy "Synth1 VST1.dll" or "Synth1 VST64.dll" to "C:\Program Files\Cubase SX\Plugins" directory.

Installation is now complete. Please confirm that Synth1 appears in the plugin menu of the host application.

At the time of version am (When you have already used Synth1 and want to succeed setting information)

1. Please execute the set succession tool (reg2ini.exe) that exists in the same directory as this file, and generate the configuration file (ini file) when improving from the version before Synth1 V1.11.
2. Please execute the plugin file "Synth1 VST1.dll" by manual operation to a VST1 plugin folder.

Installation is now complete.

Uninstallation

Please delete "Synth1 VST1.dll" of the VST1 plug in folder of the host application and a folder with this file.
In addition, Synth1 writes the set up information in the following files.

APPDATA\Daichi\Synth1\synth1.ini
ex) C:\user\user\Name\AppData\Roaming\Daichi\Synth1\synth1.ini

There is not the problem even if you do not delete it, but please delete it by manual operation when you want to delete it.

Operation

Basic Operation

Panel size and color

For ease of operation, you can change the size of the user interface panel, as well as the background and text color. These options are accessed via the opt button in the bottom of the panel --> Panel Size, Color Customizer.

- If you change the panel size, please close and reopen the window once. In some host applications, the panel does not change until you have reopened the song file.

Knobs

When you click a knob, a slider appears for manipulation. Minute adjustments can also be made by using the mouse wheel. To close the slider, right-click it or perform a left-click in a different place.

Changing programs

In the lower part of the panel there is a LCD which displays the program name. Click it to open an overview of banks/programs. Left-click the desired program to select it. Right-click to cancel.

Outline

The structure of Synth1 is shown below. The section with 16 voices simulates an analog synth with 2 VCOs. The synth also has an arpeggiator, equalizer, delay and chorus.

1	Select sine, triangle, saw or pulse as the waveshape of generator 1.
FM	Adjust the FM modulation ratio. Oscillator 2 acts as modulator, oscillator 1 acts as carrier. FM modulation is only possible when ring modulation is off.
2	Select triangle, saw, pulse or noise as the waveshape of generator 2.
ring	Switch ring modulation (AM modulation) ON/OFF. When turned on, the output of oscillator 2 is subjected to ring modulation.
track	Switch tracking of oscillator 2 ON/OFF. Tracking pitches the output according to the note number played. When turned off, sound is output at a uniform frequency.
sync	Switch the sync function ON/OFF. When turned on, the phase of oscillator 2 is matched with the frequency of oscillator 1.
pitch	Set the pitch of oscillator 2.
fine	Minutely adjust the pitch of oscillator 2.
env	Switch the modulation envelope ON/OFF. When on, the following destination of modulation varies over time according to the settings of A, D and am below.
dest	Select pitch of oscillator 2, FM or pulse width as the destination of modulation env.
A	Set the attack time of the modulation envelope.
D	Set the decay time of the modulation envelope.
amt	Set the amount of modulation variation when modulation envelope is on. Right of the centre raises the amount, left of the centre lowers the amount. The centre setting results in no modulation variation.
key shift	Transposes the pitch of oscillator 1 and 2 corresponding to the number of the note played.
pw	Set the pulse width of the pulse wave. Turn left to narrow the width, turn right to widen it. Affects both oscillator 1 and 2.
mix	Set the volume balance of oscillator 1 and 2. Turn left to increase the relative volume of oscillator 1, turn right to increase the relative volume of oscillator 2.
lfo	Minutely adjust the pitch of the oscillators.

Filter

A resonance filter and a simple distortion(saturation) effect. With the filter envelope, cutoff frequency can be varied over time.

type	Select the filter type from low-pass (12 dB), low-pass (24 dB), high-pass (12 dB) or high-pass (24 dB).
A	Set the attack time of the filter envelope.
D	Set the decay time of the filter envelope.
S	Set the sustain level of the filter envelope.
R	Set the release time of the filter envelope.
env	Set the release time of the filter envelope.
cut	Set the level of the cut-off frequency. Turn left to decrease the envelope, turn right to increase it.
res	Set the amount of resonance.
sat	Set the amount of saturation.
tr	Set the sensitivity of the cutoff frequency tracking. Adjusts how much the cutoff frequency changes according to the note number played. Turned all the way to the right, the frequency changes an octave with a one octave change in the note number played (1/12). Turn all the way to the left to leave the frequency unchanged.
vel	Select whether the amount of envelope variation changes according to the velocity of the note played.

Amplifier

Controls the variation of the amplitude over time according to an envelope.

A	Set the attack time of the envelope.
D	Set the decay time of the envelope.
S	Set the sustain level of the envelope.
R	Set the release time of the envelope.
env	Set the level of the overall volume level.
vel	Adjust how much the amplitude changes according to the velocity of the note played. Turn left to decrease the sensitivity and thus the volume change; turn right to increase it.

LFO

Controls various effects by cyclically modulating parameters of the VCO, VCA and VCF. In Synth1 the two LFOs operate independently. The frequency or amplitude of LFO1 can also be changed with information from the MIDI wheel. The sensitivity is adjusted by the common parameters wheels speed/wheel amt.

lfo	Switch LFO1 ON/OFF.
Left LCD	Select the waveshape of LFO1 from saw, triangle, sine, square, random(sample & hold) or random (smooth).
Left det	Select the target of the LFO1 modulation from oscillator 2 pitch, filter cut-off frequency, volume, oscillator 2 pulse width or FM.
Left spd	Set the frequency of the LFO1 modulation.
Left amt	Set the amount of modulation of LFO1.
Left tempo	Sync to host sequencer tempo (*1)
Left key	Sync to key on.
2	Switch LFO2 ON/OFF.
Right LCD	Select the waveshape of LFO2 from saw, triangle, sine, square, random(sample & hold) or random (smooth).
Right det	Select the target of the LFO2 modulation from oscillator 2 pitch, filter cut-off frequency, volume, oscillator 2 pulse width or FM.
Right spd	Set the frequency of the LFO2 modulation.
Right amt	Set the amount of modulation of LFO2.
Right tempo	Sync to host sequencer tempo.
Right key	Sync to key on.
(*1)	

```
(1) -> (12) -> whole note to 1/32 note  
* -> add  
+ -> up  
- -> down
```

Equalizer

A parametric equalizer/low-pass filter.

freq	Set the frequency of the parametric equalizer.
lev	Set the level of the parametric equalizer. Turn left to lower the level, turn right to raise it. Set in the middle for zero equalizing.
Q	Set the Q curve of the parametric equalizer. Turn left to flatten the curve, turn right to make it steeper.
low cut	Set the cut-off of the low-pass/high-pass filter. Turn left to reduce the higher frequencies (high-cut). Turn right to reduce the lower frequencies (low-cut).

Tempo Delay

A delay effect synchronized with the tempo of the host sequencer. Due to a maximum buffer of 3 seconds it does not work with extremely slow tempos.

ON	Switch the effect ON/OFF.
time	Set the delay time, ranging from 1/32 note triplets to whole note.
fbk	Set the feedback level.
lev	Adjust the return volume.

Chorus/Flanger

A stereo chorus/flanger effect.

ON	Switch the effect ON/OFF.
LCD	Select 1 stage, 2 stages or 4 stages for the chorus or flanger effect. 1 stage results in a nonaural effect. It seems that 1 stage is most appropriate for achieving a flanger effect.
time	Set the time delay on which the effect is based. A shorter time results in a more flanger-like effect.
depth	Set the level of modulation.
rate	Set the rate of modulation.
fbk	Set the feedback level.
lev	Adjust the level of the chorus/flanger.

Arpeggiator

A simple arpeggiator. The arpeggiator functions by automatically playing each note of a chord (or a single note) in a sequence with a fixed tempo.

ON	Switch the arpeggiator ON/OFF.
type	Selects the method of arpeggiation from up/down, up, down or random. Up/down plays the input notes from the lowest to the highest and back down again. Up plays from the lowest note and up, down plays from the highest note and down.
range	Selects the range of arpeggiation in octaves, ranging from 1 octave (oct) to 4 octaves (4oct).
beat	Selects the speed of arpeggiation from whole note to 1/32 note triplets.
gate	Set the length of each note. Turned all the way to the right, the notes sound without interruption, which is effective in combination with legato and portamento modes.

Play Mode

Settings which relate to playing style.

mode	Selects polyphonic, monophonic or legato mode. Polyphonic is the normal mode, enabling chord harmonies. Monophonic mode only enables a single voice, so chords cannot be played in this mode. Legato is similar to monophonic mode but only one voice can be played at a time. It differs from monophonic mode in that when a note is played continuously, the VCO and VCA envelopes are not triggered, so that only the pitch changes.
b.b range	Set the range of pitch change when receiving a MIDI pitch bend signal.
portamento	Set the portamento time. Portamento changes the pitch of each voice towards the target pitch, over time from the moment the note has been input.
need	Set the sensitivity to information from a MIDI modulation wheel, triggering modulation of the frequency of LFO1.
amt	Set the sensitivity to information from a MIDI modulation wheel, triggering modulation of the amplitude of LFO1.
unison	「ポリボイス」時は2ボイス、「モノレガート」時は4ボイスを使って各ノードにポリボイスを発生させます。微妙にビッチのずれた音か響かなくなるため、音に厚みがあります。
auto	「自動で消えない」は2ボイス、「残」は1ボイスを発生させる機能です。

Common Settings

Controls general settings such as the changing or saving of programs. The program management of Synth1 can handle 128 programs in each of 10 banks, giving a total of 1280 possible programs. Each program is saved as a single file. The folders which store the programs divide them into banks. These folders can be changed in the options window.

vol	Set the master volume.
poly	Set the number of possible simultaneous voices in polyphonic mode.
program	Changes the program. Click the LCD to open an overview, and select the desired bank/program.
bank	Changes the bank.
write	Writes the present program to a file. Click to open a dialog box, then select the bank and program you wish to overwrite.
opt	Open the option Dialog box. 「設定」をクリックすると、MIDI Control Change ランモードに入ります。ランモードでは、MIDIコントロールチェンジのバリエーションの設定などを指定します。 「設定マップ」を開いて行う事ができます。Synth1上のパラメータをクリックした後に、MIDIコントロールチェンジャーなどでコントロールされたSynth1のパラメータ、MIDI CCに対応づけられます。ランモードを抜けるには、vol/poly/bank/write/optのどれかをクリックします。

Option Dialog

In the options window you can general settings and MIDI settings. These settings are common to all Synth1 under starting.

General	Settings for program folder locations, and options for the user interface. The user interface panel color is set with HTML-type values (#RRGGBB).
MIDI	MIDIコントロールチェンジの編集/編集/Load/Save/MIDIユーザーの設定などを指定します。
MIDI	Receive Message: Normally the program will change when a MIDI bank select or program change message is received, you can tell Synth1 to ignore these messages, so that no program change occurs. MIDI 1:06には、mod/ka2を用いた、loadボタンで読み込んで使用していただけます。

Presets

Synth1 has 128 presets. I tried to simulate a GM set by referring to a SC-48 Pro. Alas, the first half of the presets did not turn out too well. Although some of them could come in handy, they are included more as a reference. The unique sounds from 81 upwards might be useful by being useful. If you like YMO, I'm loading program 98 and playing the high IV major chord from "Behind the Mask".

Version History

Ver.1.3 beta3 (2014.7.10)

- BugFix
 - Fixed a problem that program name list is empty display if you add a synth1 instance after removing the synth1 on DAW(Reaper, etc.)
 - Fixed a problem that reg2ini.exe and insetting.exe does not work on WindowsXP.

Ver.1.3 beta2 (2014.7.8)

- A new filter "LPFD" has been added in filter section.
 - It is a low-pass filter modeled after the diode ladder mounted on TB303, etc.
 - It is close to "LP24" but it is the filter of the fourth order, but it is fat and darker than "LP24" feel.
 - Lower frequency also increase the resonance does not decrease. I think that it fits well in the synth bass.
- The filter is oversampling process if the sampling frequency is 44.1kHz.
 - Accuracy of the square wave has been improved. (8 multiple detune/oct are excluded)
 - Cut-off frequency of the "LP24" is now moving more smoothly.
- BugFix
 - Fixed a problem that a big noise has synchronized at synth1 startup once in a while.
 - Fixed a problem that the LFO is not synchronized with the DAW once in a while.
 - Fixed a problem that the sound of synth1 is slightly changed once in a while when you change the sampling frequency in DAW.
 - Fixed a problem that DAW is crashed once in a while when you change the sampling frequency in DAW.

Ver.1.3 beta1 (2014.6.12)

- 64bit version is available.
 - you can use synth1 on 64bit host.
 - 32bit plugin file is "Synth1 VST1.dll", 64bit plugin file is "Synth1 VST64.dll".
- VST version up to 2.4. (both of 32bit/64bit)
- There is no change to the previous version in functionality.
- BugFix
 - Fixed a problem that occurred is petit noise on MusicMaker.
- Ver.1.2 (2010.5.23)
 - It corresponded to an external bank (ZIP file).
 - It comes to be able to read the ZIP file that compressed the .sy1 file.
 - It comes to be able to select it from the patch selection window of Synth1 only by putting the zip file on the external bank folder (default is "zipbank").
 - Two or more folders are included in one zip file with the hierarchy.
 - It is not possible to write in an external bank. It is only for reading.
 - The preservation place of the set up information was changed from the Windows registry to the ini file.
 - The external bank folder information was not preserved on 64bit OS or it was not possible to refer occurred. I think this event to be ameliorable.
 - Therefore, when the setting of existing Synth1 is succeeded, it is necessary to execute set succession tool (reg2ini.exe).
 - The reference) The ini file is "APPDATA\Daichi\Synth1\synth1.ini".
 - The method of selecting the bank in the patch selection window corresponding an external bank was changed to the tree view form.
 - Memo (readme.txt) of each bank folder was confirmed and it preserved it in the patch selection window.
 - It was able to be set whether to use a transparent window on the patch selection screen etc. by an optional dialog.
 - Sound Engine
 - High-pass/low-pass filter was added to Delay's feedback loop.
 - BugFix
 - Problem that slider was displayed in LCD parts at setting that doesn't use slider window

Ver.1.1 (2010.5.9)

- Sound Engine
 - The sub oscillator was added.
 - The same pitch as oscillator 1 or one octave under can be selected.
 - When OSC1 is eight multiple unison, the suboscillator becomes similar, too.
 - FM modulation also influences the suboscillator as well as OSC1.
 - The suboscillator doesn't influence the AM modulation.
 - When the wave pulse of the suboscillator is raised, the entire volume is automatically adjusted not to grow.
 - The wave pulse of the suboscillator always becomes a square wave regardless of a pulse width parameter.
 - The auto key release function was expanded to 8.
 - To operate the suboscillator effectively, it changed.
 - The amplitude value by 1/8 phases changed from 0 to +1.
 - The limiter algorithm of Filter is changed, and the noise has been improved only a little.
 - The performance of OSC1 at eight unisons has been improved a little.
- System requirements
 - It did not operate in CPU that did not support SSE2.
 - It seems to cause the expansion of the source code when keeping supporting it any further. To our regret, it was assumed operation off the subject.
 - The error message is displayed in the upper part of the panel when operating with CPU that doesn't correspond, and the sound is not generated.
- Small improvement and change of GUI
 - A part of objection of the parameter name was corrected.
 - The patch selection window etc. were shut with the escape key.
- BugFix
 - Problem of operation of sustaining pedal
 - Problem that old FM setting value remained at voice trigger
 - Problem that load/unload at unison has changed in old version
 - Problem that gain knob of Amplifier did not occasionally work
 - Problem that patch change with program change spin button was not made good after it writes it in another bank
 - Problem with thing that Synth1 window flickers according to environment
 - Problem that position where parameter selection window etc. are displayed does clip to primary window in multimonitor environment

Ver.1.0 (2010.5.4)

- The switch which choose the pitch or wrong of the patch evoked from the vst host side was usable in optional dialog. It is the result that expanded the number of banks to 100. The switch is a thing to avoid this phenomenon.
 - When this switch is on, tone choice is possibility from the vst host GUI, (as before). However, depending on the vst host, a patch is not chosen, and there is a thing kept waiting for several seconds.
 - When this switch is off, you cannot choose a patch from vst host GUI. However, the trouble mentioned above does not occur.
 - It is by default off.
- BugFix
 - The problem that pingpong delay did not become effective.
 - The problem that failed in the conversion of the patch of Synth1 of the old version.
 - The problem that a patch name did not synchronize with a VST host between Synth1 well.
 - When did over of a mouse in voice status, the problem that mouse shape became the hand shape.

Ver.1.09 (2010.5.1)

- A phase control function was added.
 - The "phase" knob in the Oscillator section immobilizes phase relations in the trigger of oscillator 1 and oscillator 2 and adjusts it. The phase is not fixed if I finish turning a knob to the left (like conventionally).
 - The "phase" knob in the Voice section immobilizes phase relations in the trigger of oscillators done unison and adjusts it. This knob should not be effective unless I immobilize phase in an oscillator section.
 - I think that I am easy to make the base sounds with a feeling of weight if I adjust the parameter mentioned above and the number of the unison voices, the unison detune.
- The number of the polyphony was expanded to 32.
 - The number of the polyphonic became the parameter every patch.
- The number of the unison voices was expanded to 8.
 - Regardless of the voicing mode, you got possible to set the number of the unison voices with less than eighty freely.
- The assignment function to LFO of modulation wheel was improved.
 - You can assign the set MIDI information was not preserved on 64bit OS or it was not possible to refer occurred.
 - I copied with a sense to the minus direction.
- I changed effect of the unison mode knob exponentially.
 - It was easy to look and changed the fonts such as patch select windows.
 - The color of the LCD was changed to be able to brighten a little.
 - I made drawing of the LED simple and improved easiness in seeing.
 - The panel size of the default became 150%.
 - Voice status (disabled) key on / key off / ready was displayed.
 - I made drawing of the LED simple and improved easiness in seeing.
 - The Lissajous indication function was abolished.
 - The size of the panel was expanded to 250%.
- BugFix
 - The problem that all parameters were for an instant when I carry out a change to preset in Reapier.
 - The problem that a screen flickers was not displayed in a dialogue of the MIDI control assignment.

Ver.1.08 (2010.4.25)

- The DX1 version became the discontinued.
 - Because the maintenance of the development environment was difficult, I abolished the DX1 version.
- The Synth1 installer became the discontinued.
 - Because there was not the necessity with the abolition for DX1, I abolished the installer. On the other hand, I attach tool (insettings.exe) initializing the setting (windows registry) such as bank folders. When you use Synth1 for the first time, please initialize setting with this tool.
- The number of the banks was expanded to 100.
 - The setting initialization tool was added to bank00 - 09, but does not set bank100 - 99. When you use bank100 - 99, prepare a folder by yourself. Please set it in an optional dialog.
 - Correspondence of the malfunction that the MIDI lab of the optional dialogue is replaced by without permission.
 - Just after a tone save, time when a program change was not performed fixed the bug that there was.
- Ver.1.07 (2006.5.3)
 - Play Mode
 - ユニゾン時のステレオ化及び、stereo spreadつまみの追加
 - ユニゾン時のビッチ調整つまみの追加
 - Effect
 - Phaserの追加
 - GUI
 - リザーブアイコン形スイッチの追加
 - 全体的な描画性能の改善
 - その他内部処理改善等
- Ver.1.07(beta) (2006.3.26)
 - BugFix
 - Synth1起動時に、一瞬ノイズがでる問題を解決
- Ver.1.07(alpha2) (2005.1.10)
 - GUI
 - ノブの入力時のスライダーWindow表示をオプション扱いとした。(設定画面)
 - BugFix
 - DXIでクラッシュする件を修正
- Ver.1.07(alpha) (2005.10.1)
 - Oscillators
 - OSC1 8多重ユニゾンつまみの追加
 - OSC2 pitchつまみのスムーズ化
 - FMのFO変化量をわかりやすく、+/-で調整可能
 - Filter
 - AMOUNTのバリエーション補正
 - LFO
 - 変調先の初期値にPAWを追加
 - Equalizer
 - Effectの追加
 - Tempo Delay
 - デレイレイトタイム変更時の音をテューブエコーっぽく、
 - ステレオ化、それにとともに以下の変更・追加
 - 補正に、音の立ち上がり遅延を抑制するパラメータ(ディレイタイム)、ピンポン(PP)
 - 左右のディレイタイムを個別に設定するパラメータ(spread)
 - Levelつまみは廃止し、原音とディレイ音とのバランス調整式とした(dw)
 - Chorus/Flanger
 - 内部処理の全面変更により、ノイズレスの最もよい音に
 - RATEの最適化(0.01Hz ~ 4000Hz)
 - 遅シローンtime(0.05ms)を出せるように変更 (feedbackと組み合わせて低域ブースト可能)
 - feedbackを両方向にできるように変更
 - Play Mode
 - ユニゾン時のデチューンつまみを追加
 - その他内部処理の最適化もいろいろ

Ver.1.06 (2003.02.05)

- about sound
 - unison mode
 - portamento mode
 - smooth vef freq knob
 - vef resonance feedback
 - vef destination -> saturation
 - modify vef velocity
 - vco SN up for sine triangle
 - modify sync+FM
 - modify chorus noise reset
 - Noise generator on each voice
 - LFO tempo sync, key sync
 - LFO max ramps speed up
 - modify delay noise
 - modify attack time
 - modify volume gain sustain
 - modify velocity
 - etc.
- about MIDI
 - Sustain Pedal
- BugFix
 - modify mod env max value
 - modify chorus memory buffer
 - modify pitch env & portamento customizer
 - modify ar range is hidden by FruityLoops randomize function
 - modify LFO random
- about GUI
 - change delay arpeggiator tempo display
 - LCD filter selection
 - direct select LED
 - each program has color attribute
 - change drawing of the LED simple and improved easiness in seeing
 - default panel size => 130%
 - change knob size
 - click bank LCD -> select program(s)
 - change some slider display
 - kgart x->-legato o

Ver.1.0a (2002.11.18)

- SONAR+Synth1 to ASIO Exporter, TrackDown使用時に落ちるバグを修正した。

Ver.1.04 (2002.10.30)

- Fixed a bug that caused a crash upon using Synth1.dit with Synth1

Ver.1.03 (2002.10.28)

- Fixed a GDI resource leak and improved stability in Win98/Me
- Compacted the memory used for graphics

Ver.1.02 (2002.10.27)

- Fixed a bug that prevented proper selection of the waveshape for LFO in VST1 mode
- Fixed a memory leak that occurred after use in VST1 mode
- Added the option of changing the color and type of the user interface
- Adjusted the position of dialog boxes
- Added display of clipping on knobs; mixer graphics changes.
- Narrowed slider displays to reduce the overlap with the neighboring controls
- Fixed lack of gradation for filters when used with a non-SSE processor

Ver.1.01 (2002.10.15)

- VST1 compatibility
- Added the option of ignoring MIDI messages
- Adjusted the position of dialog boxes