

# Vsampler3

## User's Manual Start Up and Basics



## Introduction

---

© 1998-2004 Speedsoft Audio Tools GmbH, Döbeln, Germany  
All rights reserved

Stand: 26.03.2004

Products made by the following companies are mentioned solely for information purposes.

Microsoft, Microsoft Windows, DirectX, DirectSound, WDM © Microsoft Corporation  
Cubase, Cubase SX, Steinberg, VST, ASIO, HALion, LM4 © Steinberg Media Technologies AG  
Cakewalk, Sonar, DXi © Twelve Tone Systems, Inc.  
Emagic, Logic © Emagic Soft- und Hardware GmbH  
Battery, Kontakt, Kompakt, Intakt © NATIVE INSTRUMENTS Software Synthesis GmbH  
Sound Blaster, EAX, Audigy, Live!, E-MU © Creative Technology Ltd.  
ACID, Soundforge © Sonic Foundry, Inc.  
Reason, ReBirth, ReWire, ReCycle, REX © Propellerhead Software AB  
Ogg, Vorbis © Xiph.Org  
FLAC © GPL/LGPL

All software and hardware terms not specified, as well as brand names, are registered trade marks or trade marks of their respective owners.

## License agreement

In the following, “software” designates the program “VSampler” contained in the packaging, including the manual, Soundlibraries and purchased registration key. “Manufacturer” designates the company Speedsoft.

The buyer acquires the non-exclusive right from the manufacturer to use the software for an unlimited period of time on a suitable computer. With the opening of the CD packaging, the buyer agrees to the following license agreement:

The buyer is entitled to resell the software, to install the software on one computer per purchased license and to make backup copies of the software for personal use.

The buyer is not entitled to keep backup copies of the software after sale, to rent or lend the software, to manufacture or distribute copies of the software, or to change the software (with exception of the Soundlibraries) in any way.

The software has been produced with the utmost care. Buyer and manufacturer agree that it is not possible to develop an absolutely error-free software for all applicable conditions. The manufacturer will repair known software bugs as quickly as possible. The suitability of the software for a specific purpose is not guaranteed by the manufacturer. The buyer is not entitled to compensation in the case of a defect, except in states where liability exclusion is not permissible. In any case, liability is limited to the amount of the purchase price. Liability for consequential damages is excluded. The customer is responsible for the storage and back-up of their data.

Venue for all disputes related to the software is the state court of the company location of MAZ at the time of the dispute. Applicable law is the one of the Federal Republic of Germany. Should any provision of this agreement contravene valid law all other provisions will continue in full force and effect.

### Note

Make sure to back up your data.

A power failure, a program crash or a virus can destroy your files. Make sure that you regularly back up important data such as Soundlibraries and song files, and keep these in a safe place, preferably outside of your computer at an external data medium. This also applies to your serial number.

### Warning



Due to the variety of VSampler's control possibilities, unexpected high signal levels can occur that can harm both your hearing and your equipment if the playback level is too loud. Please do not turn up your amp any louder than is comfortable for you to listen to at the highest digital output level (0 dB in the VSampler mixer).

## Table of Contents

<b>1</b>	<b>Introduction .....</b>	<b>9</b>
1.1	Welcome! .....	9
1.2	About this Manual .....	11
1.3	Setting Up Your System.....	12
1.3.1	Minimum system requirements .....	12
1.3.2	Recommended system requirements .....	12
1.3.3	Installation .....	13
1.3.4	Starting VSampler .....	16
1.4	Registration .....	16
1.4.1	Restricted demo-mode .....	16
1.4.2	Registering the serial number online (once) .....	16
1.4.3	Inserting the registration key in VSampler .....	18
1.5	OEM Version vs. Independent Version .....	20
1.5.1	What does OEM-Version mean? .....	20
1.5.2	Restrictions of the OEM version .....	20
1.5.3	Free updates.....	21
1.5.4	Upgrade to the VSTi-DXi-ReWire-Standalone package .....	21
<b>2</b>	<b>Start.....</b>	<b>23</b>
2.1	Quickstart.....	23
2.2	Decision: Standalone, Plug-in or ReWire?.....	24
2.2.1	Standalone version.....	24
2.2.2	VSTi/DXi plug-in.....	25
2.2.3	ReWire .....	26
2.3	Standalone-Version .....	27
2.4	VSTi/DXi Plug-in .....	28
2.4.1	Setting up the VSTi plug-in in Cubase SX .....	29
2.4.2	Setting up the VSTi plug-in in Cubase VST .....	31
2.4.3	Setting up the DXi plug-in in Sonar .....	32
2.5	ReWire .....	35
<b>3</b>	<b>Graphic User Interface (GUI).....</b>	<b>37</b>
3.1	Typical Control Elements .....	37
3.2	Drag & Drop .....	40
3.3	Less is more .....	41
3.4	The Small View .....	43
3.4.1	Title bar and Status displays .....	44

3.4.2	MIDI channel slots and controllers.....	45
3.4.3	Instruments Pool.....	48
3.4.4	Import Window.....	51
3.4.5	On-Screen Keyboard.....	55
3.4.6	Bank Manager.....	56
<b>4</b>	<b>Operation.....</b>	<b>57</b>
4.1	Supported Import Formats.....	57
4.2	Loading a Soundlibrary.....	58
4.3	Importing Instruments.....	59
4.3.1	Importing per menu item “File   Import”.....	60
4.3.2	Importing per drag & drop.....	60
4.3.3	Importing using the Import Window.....	60
4.3.4	Importing from the Bank Manager.....	64
4.4	Assigning Instruments to MIDI Channels.....	65
4.4.1	The MIDI channel’s padlock symbol.....	65
4.4.2	Decision: Assign Instruments in Sequencer or in VSampler?.....	66
4.4.3	Assigning MIDI channels in the sequencer.....	66
4.4.4	Assigning MIDI channels in VSampler.....	67
4.4.5	Troubleshooting: no sound when playing the keyboard?.....	68
4.5	Using Separate Outputs.....	70
4.5.1	Display of the assigned output devices.....	71
4.5.2	Assigning Instruments to output devices.....	72
4.5.3	Assigning Samples to individual outputs (DXi, VSTi, ReWire)..	73
4.6	Recommended Working Methods and Organization.....	74
4.6.1	General tips.....	74
4.6.2	Settings.....	74
4.6.3	Basis for working efficiently.....	75
4.6.4	Assembling the song-specific Soundlibrary.....	75
<b>5</b>	<b>Important General Settings.....</b>	<b>77</b>
5.1	Setting Up Audio Devices.....	77
5.1.1	Standalone version.....	77
5.1.2	VSTi, DXi, ReWire.....	79
5.2	Setting Up Individual Outputs.....	80
5.2.1	Standalone version.....	80
5.2.2	VSTi, DXi, ReWire.....	80
5.2.3	Plug-in: changing the number of outputs in a project.....	82
5.3	Setting Up MIDI Devices.....	83
5.3.1	Connecting to a MIDI keyboard.....	83
5.3.2	Setting up the virtual MIDI cable.....	84

5.4	Optimizing Performance .....	86
5.4.1	Setting the Resampling quality.....	86
5.4.2	Limiting polyphony - background.....	87
5.4.3	Limiting polyphony - implementation.....	89
5.4.4	Optimizing DRC.....	90
5.5	Decision: Linked or Embedded Samples?.....	93
5.5.1	Comparison .....	93
5.5.2	Recommendation.....	96
5.5.3	Automatic search for not-found Samples .....	96
5.6	Decision: Save the Library in the host project?.....	97
5.6.1	Project-oriented: saving the Bank in the host project.....	98
5.6.2	Soundlibrary-oriented: saving in a .VS3 file .....	98
5.6.3	Recommendation.....	98
5.7	Adjusting the keyboard velocity .....	99
<b>6</b>	<b>Basics.....</b>	<b>100</b>
6.1	What is a Sampler?.....	100
6.2	MIDI and Sequencer .....	101
6.2.1	The classic MIDI cable.....	101
6.2.2	The sequencer.....	101
6.2.3	The 16 MIDI channels.....	102
6.2.4	Sequencer tracks vs. MIDI channels .....	103
6.3	Frequencies, Bits and Floating Points .....	104
6.3.1	Sampling Frequency.....	106
6.3.2	Bit depth .....	107
6.3.3	Zero clipping thanks to floating point processing .....	107
6.4	The Structure of a VSampler Soundlibrary.....	108
6.4.1	Soundlibrary .....	109
6.4.2	Instrument.....	109
6.4.3	Zone.....	110
6.4.4	Sample.....	111
6.4.5	Multi.....	112
6.5	Dynamic Resource Control (DRC) .....	112
6.5.1	The advantage.....	112
6.5.2	Instrument level (DRC 1) .....	112
6.5.3	Sample level (DRC 2) .....	113
6.5.4	Maximum size of Instruments .....	113
6.6	Polyphony .....	114
6.6.1	The more, the...? .....	114
6.6.2	Counting Voices .....	114
6.7	Archiving and Internet Exchange of Soundlibraries .....	115

## Introduction

---

6.8	Optimizing the PC for Audio Performance .....	116
6.8.1	Purchasing decisions: hardware.....	116
6.8.2	Optimizing Windows XP for audio processing .....	119
<b>7</b>	<b>Support.....</b>	<b>120</b>
7.1	Contact .....	120
7.2	Updates .....	120

# 1 Introduction

## 1.1 Welcome!

Speedsoft and MAZ congratulate on your purchase of VSampler 3!



Small View of VSampler 3

VSampler transforms your Windows PC into a 255 voice polyphonic software sampler that transforms each recorded sound into a musical instrument. It provides all of the classical sampler features in excellent sound quality, and also offers you a multitude of new opportunities. In cooperation with the users of its [award-winning predecessor](#), an intelligent software sampler has been developed which, beneath a truly transparent surface, combines extensive signal processing abilities with simplest handling. Drag & drop actions and context menus allow quick access to all functions and provide for a smooth workflow.

VSampler can operate either as a plug-in (VSTi or DXi) in your sequencer, or it can run as an independent program, connecting via Rewire or MIDI. The included “virtual MIDI-cable” also connects VSampler to classical MIDI sequencers.

VSampler loads Instruments in the following popular sampler formats: SF2™, ReCycle™ (RCY, REX, RX2), Gigastudio™, HALion™, Kontakt™, DLS, AKAI™ (S1000/S3000 CD and S5000/S6000 .AKP files) and E-MU™ III / IV CDs, as well as Samples (WAV, AIF) and drum kits (LM4™, Battery™ KIT).

3.1

~~OEM~~

Some of the previously mentioned sequencer interfaces and import formats are not available in the VSampler 3.0 OEM version, see “1.5. OEM Version vs. Independent Version” on page 20.

VSampler’s unique Instrument preview allows you to test different sounds with a single mouse-click even during playback. Owners of an SB Live! or Audigy sound card will be pleased that VSampler can also save files in the popular SF2 format.

VSampler’s various envelope types which can be synchronized to the song tempo, it’s LFO’s and it’s velocity sensitive filters ranging from subtle to aggressive are all conducive to sound editing. Instruments can be further refined using either the included effects (Reverb, Delay, Phaser, Distortion, EQ ...) or any VST plug-in. The animation of all effect-, envelope- and filter parameters in a mutual modulation matrix, creates Instruments with extraordinary dynamics and convincing, realistic playability. The included presets for effects, envelopes and modulations will get you off to a good start.



transparent auto-zoom envelopes

Whether you want a quick playback module for everyday use, or a creative tool with the qualities of a synthesizer, VSampler 3 offers you both in one versatile instrument.

Speedsoft and MAZ hope you enjoy using VSampler!

## 1.2 About this Manual

Manuals usually begin with sentences such as: “please take the time to read this user manual carefully.” We certainly don’t want to stop you. This manual “Start Up and Basics” helps you set up VSampler on your system, and explains the basic concept and use of VSampler as well as it’s most important settings.

Further information, such as how to build your own sampler instruments, is available in the VSampler Reference Manual. This is included as a PDF file with the VSampler version 3.1 and up, and can be downloaded for free from the VSampler website [www.vsampl.com](http://www.vsampl.com) as soon as version 3.1 is released, or a print version can be purchased for a nominal price.

After the first phase of testing, we would like to suggest that you take a look at the appropriate chapter in this introduction or in the Reference Manual while you are working with VSampler. The better you are at taking advantage of VSampler’s capabilities, the faster you will be able to realize your ideas in the future. Often, there are several ways of performing an operation, but in the long run, the most obvious way is not always the shortest.

As with every other instrument, the old adage “practice makes perfect” also applies to VSampler.

The manual will give some background information if it is needed in order to understand a chapter. We do however assume that you have some basic knowledge about your sequencer and music software. Please don’t expect a comprehensive treatise on the subject of “Digital Audio Workstation for the PC.” A huge amount has been written on this and other music-related topics. Look around and you’ll certainly find a book that fits your needs.

All information in this manual refers to VSampler 3.1

The term “VSTi plug-in” is used to mean “VST instrument plug-in” in order to differentiate it from VST effect plug-ins.

## 1.3 Setting Up Your System

### 1.3.1 Minimum system requirements

In order to use VSampler as an instrument, your PC must fulfill the following minimum requirements.

#### Hardware

- CPU (processor): Intel Pentium II 400 MHz and up (or comparable)
- RAM (main memory): 256 MB, VSampler itself uses approx. 25 MB
- Graphics card: 800 x 600 pixels, 16 Bit color depth
- Soundcard:
  - VSampler VSTi/DXi/ReWire: depending on host sequencer
  - VSampler Standalone: each with an appropriate driver for ASIO or DirectSound (not emulated)

#### Software

- Operating system Microsoft Windows 98SE, ME, 2000 or XP
- VSampler VSTi/DXi plug-in: Host sequencer with support for the Synth plug-in interfaces VSTi or DXi
- VSampler ReWire-Instrument (slave): Host sequencer (master) supporting the ReWire interface



The OEM version “VSampler 3.0 DXi” includes the DXi-plug-in, but not VSTi plug-in, ReWire, Standalone version and virtual MIDI cable. If you like, you can purchase them as an upgrade, see “1.5. OEM Version vs. Independent Version” on page 20.

### 1.3.2 Recommended system requirements

VSampler can operate with the above minimum system requirements. However, in order to playback larger Soundlibraries in a song with an intricate arrangement and a large number of Voices, the following system profile is recommended (see “6.8.1. Purchasing decisions: hardware” on page 116):

- Intel Pentium IV of 1 GHz and up (or comparable), the faster the processor, the greater number of possible Voices (see “6.6. Polyphony” on page 114)

- 512 MB RAM: the more memory, the larger the Instruments that can be played even without using DRC (see “6.5. Dynamic Resource Control (DRC)” on page 112)
- Fast hard disk with 7200 rpm<sup>1</sup> or more: the faster the hard disk, the greater the number of Voices possible (polyphony) with activated DRC. A fast hard disk also speeds up the loading of Soundbanks.

If you want to use VSampler as a live instrument, and play it with a MIDI keyboard and/or a MIDI controller, it is recommended that you use a sound card with an ASIO driver with a latency below 15 ms.

We recommend to use the Microsoft Windows versions 2000 or XP. Based on our experience, these are more reliable than the earlier versions 98 and ME.

### 1.3.3 Installation

#### **Boxed version**

Place the program CD in your CD-ROM drive. Depending on the auto-start settings of your system, either the setup program will start automatically, or you must open setup.exe in the Explorer.

#### **Download version**

Get the VSampler download-version from [www.vsamplere.com](http://www.vsamplere.com) and start the setup program from the Explorer by opening the self-extracting .exe file.

Please follow the instructions of the setup program as described below:

#### **Step 1**

Choose the language for the GUI (Graphic User Interface) and Help texts.

#### **Step 2**

Read the VSampler 3 license agreement and accept it if you agree to it (necessary for installation).

#### **Step 3**

If you're interested, read the quick information of the latest version

#### **Step 4**

---

<sup>1</sup> Revolutions per minute: The more revolutions, the faster data can be continuously read.

## Introduction

---

Choose the directory on your hard disk where you want VSampler to be installed – the directory of a previously installed earlier version will be recognized automatically and suggested.



If you have previously installed an earlier version of VSampler 3 on your hard disk, please select the same directory. This guarantees that VSampler will retain all of your settings, and that no orphaned VSampler data will be left stranded on your hard drive.

### Step 5

Choose the components which you wish to install.



The first two options (at least) should be selected. Exception: The current version of VSampler is already installed, and you just want to add one of the other options.

The lower options are for selecting how VSampler should connect with your sequencer. Select the appropriate variation(s). You can find a list of popular synthesizers and the preferable way of connecting each to VSampler in section 2.2 on page 24.



VSTi plug-in, ReWire and the virtual MIDI cable can also be installed by owners of a VSampler 3.0 OEM registration key. They will then be available in the restricted demo-version, and can be tested thoroughly.

If you like, you can purchase an upgrade including VSTi plug-in and Standalone version (incl. ReWire and the virtual MIDI cable), see “1.5. OEM Version vs. Independent Version” on page 20.

Note about the VSTi plug-in: Please check whether VSampler’s “VST plug-in directory” shows the correct “VST plug-ins” directory, i.e. the one that your sequencer actually uses. Otherwise change it with the “Browse” button.

Note about the Speedsoft virtual MIDI cable: If this is installed, a MIDI output to VSampler will appear throughout Windows (i.e. in every MIDI sequencer). It is only necessary to install this if your sequencer supports neither VSTi/DXi plug-ins, nor sending MIDI data per ReWire. For more information, see 2.2.1. on page 24.

### Step 6

Choose the type of files which should be associated with VSampler. This means, whenever you click one of these files in the Explorer, it will be automatically loaded in VSampler (see the tip at the end of this section).

### Step 7

Click “Start Install” to complete the installation.



Tip about associating file types with VSampler: The files can still be opened with any other (appropriate) program. You can also change the association of the file type at any time:

- in the Explorer, click with the right mouse button on a file whose association you wish to change, and select “open with...” and then “select program”
- select the program from the list
- select the option “Always open file with this program” and click “OK”

### 1.3.4 Starting VSampler

After you have installed VSampler, you can start the program for the first time. For more information concerning the first start of VSampler see section “2. Start” on page 23.

## 1.4 Registration

### 1.4.1 Restricted demo-mode

After installation, VSampler starts up in demo mode. In comparison to the full version, the demo version has two restrictions.

- Soundlibraries can not be saved
- Playback is interrupted regularly by a beeping noise

In order to remove these restrictions, you must register your serial number online (this must only be done once), whereupon you will receive your permanently valid registration key, which you must then paste into VSampler.

### 1.4.2 Registering the serial number online (once)

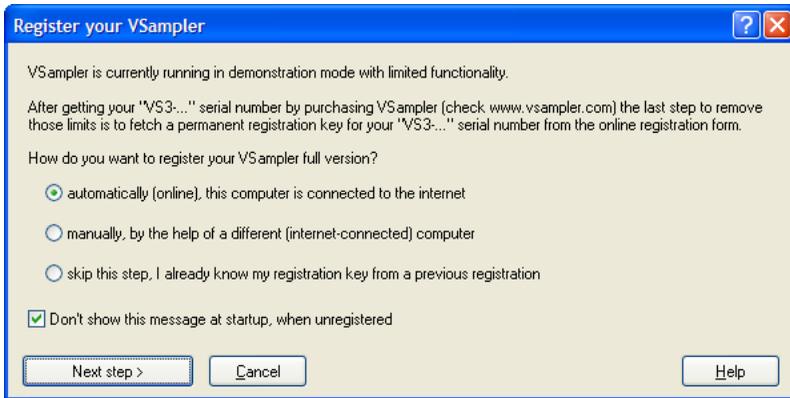
VSampler comes with a serial number in the form of “VS3-12345678-12345678-12345678-12345678.” This can be found either on the CD cover (boxed version) or it will be sent to you by email (download version). In order to remove these restrictions, you must register your serial number online, whereupon you will receive your permanently valid registration key in return.



As opposed to e.g. the product activation scheme of Microsoft Windows XP, VSampler must only be registered online one single time.

By registering your “VS3-...” serial number, you receive a permanently valid registration key, which will be accepted by every VSampler 3.x version on any computer. Also, after re-installing VSampler or even Windows, you can immediately insert the key in VSampler (see screenshot, option “skip this step”).

In order to start the registration, select “Register” from VSampler’s “Help” menu. This occurs automatically the first time you start VSampler. VSampler offers three registration variations:

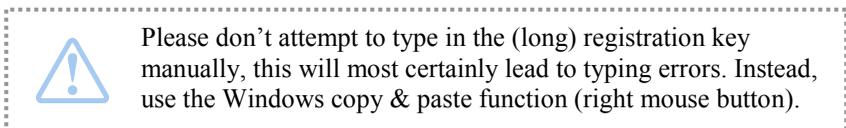


the three registration variations

### **Automatic (online)**

For the automatic registration, your computer must be connected to the Internet. Unless your computer is permanently online, you must now connect to the Internet manually.

VSampler automatically opens your Internet browser with the online registration form, so that you can enter your serial number. After sending the completed form, your permanently valid registration key will be shown on the website. Now copy & paste it in the large text field in VSampler, as described in the next section “1.4.3. Inserting the registration key in VSampler.”

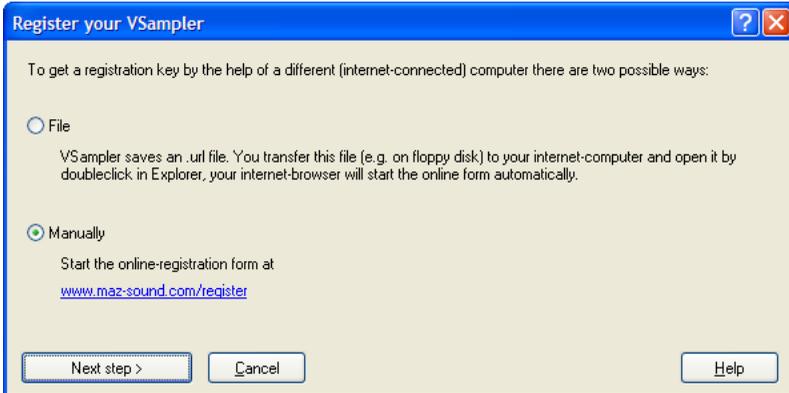


### **Manually**

If your music computer does not have Internet access, you can fill out the online registration form from another computer in order to enter your serial number:

[www.maz-sound.com/register](http://www.maz-sound.com/register)

Alternately, VSampler can save this address as an .url file, which you can transfer to an Internet PC on a floppy disk in order to open the online registration form from the Internet PC by double-clicking the .url file.



registration with the help of another computer with Internet access

### 1.4.3 Inserting the registration key in VSampler

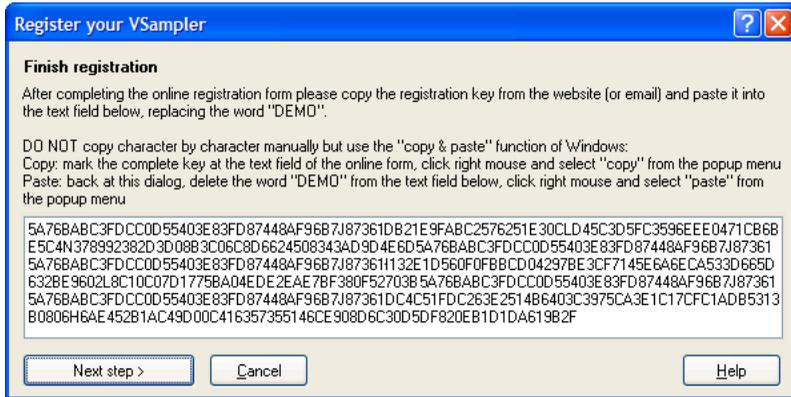
After sending the filled-out online registration form, a permanently valid registration key will be created, which will be shown on the website. Copy & paste it into the large text field in VSampler. See the following screenshots.



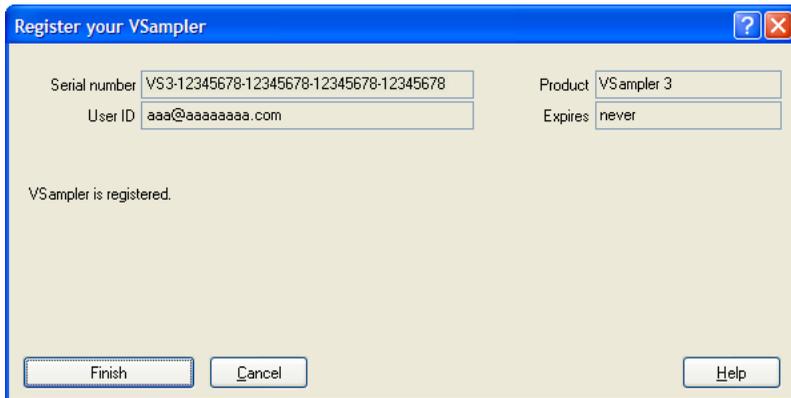
Please don't attempt to type in the (long) registration key manually, this will most certainly lead to typing errors. Instead, use the Windows copy & paste function (right mouse button).

If you have registered your copy of VSampler on another computer due to lack of Internet access, copy the registration key onto a floppy disk as a text file, and then paste the key from the text file into VSampler's registration page at your music PC. This way, you won't have to type it in manually.

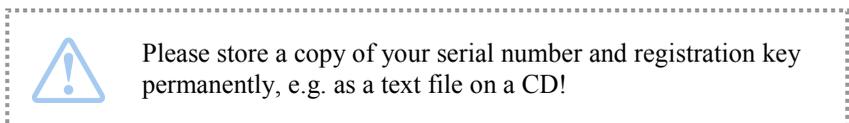
After the registration key has been pasted in, your screen should look like this:



To complete the registration, click the button “next step” for the last time. Afterwards, the successful registration will be shown:



You can view your current registration status at any time by pulling down the “Help” menu and selecting “Register.”



You will receive a summary of your registration with all relevant details in an email. This should be saved as a text file on an external medium, i.e. on CD. In the future (for example after re-installing Windows or VSampler) you can paste your registration key into VSampler immediately without having to register online again.

## 1.5 OEM Version vs. Independent Version

### 1.5.1 What does OEM-Version mean?

In addition to the VSampler package offered at [www.vsampl.com](http://www.vsampl.com), an OEM<sup>1</sup> version of VSampler is also available, bundled with other products. An OEM is a manufacturer (e.g. a sequencer or soundcard manufacturer), who integrates components of other manufacturers (e.g. VSampler) in their own product, and distributes this product under their own name.

Despite the significantly lower price, the OEM version of VSampler offers all of the functions available in the full version at the time of OEM licensing – however, only within that package. Outside of the package, OEM versions of VSampler only operate in the restricted demo-mode (see section 1.4.1. on page 16). This currently applies to “VSampler 3.0 DXi” from the Cakewalk package “Sonar 3 Producer.”

### 1.5.2 Restrictions of the OEM version

The VSampler 3.0 DXi version distributed by Cakewalk with its “Sonar 3 Producer” edition has the complete functionality of the VSampler 3.0 full version’s DXi plug-in. It is functional within all DXi compatible sequencers such as Cakewalk [Sonar](#) or [Project 5](#), and includes all future updates offered by Cakewalk that improve existing 3.0 features or fix bugs.

VSTi plug-in, ReWire- and Standalone version, as well as some additional new functions, which are not offered by Cakewalk as a free update to the VSampler OEM version, can be purchase as an upgrade at the online-shop of [www.vsampl.com](http://www.vsampl.com). At “1.5.4. Upgrade to the VSTi-DXi-ReWire-Standalone

---

<sup>1</sup> Original Equipment Manufacturer

package” on page 21 you can find the exact listing of the additionally available features.



Whenever one of these features is mentioned in the manual, it will be marked by this symbol.



### 1.5.3 Free updates

Updates to the OEM version provided with the “Sonar 3 Producer” package, can be downloaded from Cakewalk in the form of patches. Updates can also be downloaded from [www.vsampl3r.com](http://www.vsampl3r.com).



The latest VSampler 3.x update for all VSampler 3 versions can be downloaded at [www.vsampl3r.com](http://www.vsampl3r.com)

This download is suitable for updating all versions of VSampler 3. This way, users of the OEM version can test the VSTi plug-in and Standalone version of VSampler in the restricted demo-mode (see section 1.4.1. on page 16). VSampler automatically recognizes the previously installed version, and retains all of it’s settings. This also includes the registration level, i.e. the registration key (for either the OEM version or the full VSTi-DXi-ReWire-Standalone package) determines which features will be activated.

All future improvements and bug fixes of existing features of “VSampler 3.0 DXi” will of course be free for users of the OEM version as well. This is also valid for numerous new features which have been added in VSampler 3.1, but not for all of them:

### 1.5.4 Upgrade to the VSTi-DXi-ReWire-Standalone package

If you wish to add features, which are not offered by Cakewalk as a free update to the VSampler OEM version, or if you would like to use the VSTi plug-in, ReWire or Standalone version of VSampler, no problem. The upgrade can be purchased at the online-shop of [www.vsampl3r.com](http://www.vsampl3r.com) at a reasonable price. It includes the following features, in addition to those of the OEM version.

### **VSTi, ReWire, Standalone, virtual MIDI cable**

Users of the full VSTi-DXi-ReWire-Standalone package can use VSampler and its Soundlibraries with identical sound in almost any sequencer:

- as a VSTi plug-in, inside of e.g. [Nuendo](#), [Cubase](#), [Cubasis](#), [Logic](#), [Acid](#), [Orion](#), [Fruityloops](#), [Renoise](#), [Samplitude](#), [n-track](#)
- as a DXi plug-in, inside of e.g. Cakewalk [Sonar](#) or [Project 5](#)
- by using ReWire with e.g. [Live](#) or [Protools](#)
- by using the included virtual MIDI cable with any classical MIDI sequencer, e.g. [Cakewalk Pro Audio](#), [Band-In-A-Box](#), [Power Tracks Pro](#), [Sibelius](#), or [Finale](#)

The Standalone version also lets you use VSampler without a sequencer as a live instrument. 16 individual stereo outputs are available when using multi-channel soundcards (ASIO or DirectSound). For more information see "2.2. Decision: Standalone, Plug-in or ReWire?" on page 24.



Whenever VSTi, ReWire, Standalone version or virtual MIDI-cable is mentioned in the manual, this symbol marks their absence in the OEM version.

### **New features included with VSampler 3.1 and up**

Some of the new features added after the release of VSampler 3.0, are not offered by Cakewalk as free update to the "VSampler 3.0 DXi" OEM version. They can however be added, and are also part of the upgrade. This affects the following additional features:

- playback of Instruments of any size, without being limited by RAM size
- import of the formats ReCycle™ (RCY, REX, RX2), Kontakt™, Battery™ and E-MU™ III / IV CD
- group effects and individual outputs at Sample level, e. g. to add different effects to the bass-drum and snare-drum of a drum kit, or to send their signals to different mixer channels of the sequencer



Whenever one of these features is mentioned in the manual, it will be marked by this symbol.



## 2 Start

When you start VSampler for the first time, VSampler offers to search your computer for installed VST effect plug-ins, in order to make them available for your VSampler Instruments. If you are unsure whether VSampler should do this, click “no” for the moment, you can perform the search at another time (see VSampler Reference Manual).

### 2.1 Quickstart



VSampler Small View: 16 MIDI channels, the most important controls, on-screen keyboard

When starting VSampler for the first time, the Soundlibrary "startup.vs3" is loaded automatically. Loading and importing other sounds is described in the sections “4.2. Loading a Soundlib” on page 58 and “4.3. Importing Instruments” on page 59.

You can play the first Instrument “euro” right away using your MIDI keyboard, your sequencer, or the on-screen virtual keyboard. As soon as VSampler receives MIDI signals, the number of the MIDI channel receiving data lights up briefly. Test the velocity behavior of this sound – the harder you strike the keys (or by clicking farther down on a key of the on-screen keyboard), the brighter the sound.

Everything else you’ll need to get started using VSampler’s powerful features will be explained in the following chapters – have fun!

## 2.2 Decision: Standalone, Plug-in or ReWire?

VSampler can be used with practically any sequencer, because it supports all important sequencer interfaces under Microsoft Windows. Which variation of VSampler you should use depends on your sequencer. Since most current sequencers support several interfaces, here is some information to help you make your decision. VSampler can be started in three different ways:

### 2.2.1 Standalone version



The Standalone version of VSampler transforms your PC into a dedicated sampler with 16 channel MIDI input and up to 16 individual stereo outputs with an ASIO or DirectSound soundcard. This way, the entire processing power of your computer is available to VSampler. If you're not using a sequencer (e.g. to play VSampler as a live instrument), this is your best option.

The Standalone version of VSampler is not just for live performance. The included virtual MIDI cable (see “5.3.2. Setting up the virtual MIDI cable” on page 84) enables VSampler to connect to any MIDI sequencer, e.g. [Cakewalk Pro Audio](#), [Band-In-A-Box](#), [Power Tracks Pro](#), [Sibelius](#) or [Finale](#). In comparison with the plug-in version, the Standalone version runs outside of the sequencer and is treated like external MIDI hardware. There is neither an audio connection to the mixer of the sequencer, nor can the sequencer synchronize the timing of the connected devices. This is a general disadvantage of the 20 year old MIDI standard: all data is sent indiscriminately in succession (one after another), at a rather leisurely tempo. The consequence is that even perfectly simultaneously played notes never arrive at the sound module (VSampler) at the same time, but rather one after another with a slight and normally inaudible temporal delay. Nonetheless, it hasn't kept musicians over the last 20 years from making good electronic music, without which VSampler probably wouldn't exist.

#### Conclusion:

The Standalone version is ideal for using VSampler independently (without a sequencer). In order to control VSampler through a classic MIDI sequencer, the connection per virtual MIDI cable is the way to go. If your sequencer supports VSTi/DXi plug-ins or ReWire, then these versions are preferable.



Make sure that the audio output from VSampler and from the sequencer don't block each other!

If you want both programs to use the same soundcard for audio output, then the soundcard driver must support multi-clients. This is the case with most multi-channel soundcards, which use separate individual outputs. Many older soundcards however do not support multi-clients.

### 2.2.2 VSTi/DXi plug-in

If your sequencer supports the plug-in interface VSTi or DXi, then you should run VSampler as a plug-in. The VSTi plug-in can be used with e.g. [Nuendo](#), [Cubase](#), [Cubasis](#), [Logic](#), [Acid](#), [Orion](#), [Fruityloops](#), [Renoise](#), [Samplitude](#) and [n-track](#). The DXi plug-in can be used with Cakewalk [Sonar](#) and [Project 5](#).



VSTi plug-in and individual outputs per Sample are not available in the VSampler 3.0 OEM version, see “1.5. OEM Version vs. Independent Version” on page 20.

The seamless integration of VSampler as a sequencer plug-in has significant advantages compared to the Standalone version hooked up with the virtual MIDI cable:

- **sample accurate timing:** The sequencer has complete control over audio/MIDI synchronization - automatic compensation of delay during playback: 50 notes played at once are in fact heard absolutely simultaneously – impossible with a MIDI cable
- **up to 32 flexible individual outputs:** (up to 16 in the OEM version)
  - switchable between mono and stereo: 32 mono or 16 stereo or any mixed combination
  - Samples *within* an Instrument can also be routed to individual outputs (not in the OEM version)
- **one mixer for everything:** audio tracks and Instrument plug-ins are all mixed in the sequencer's mixer – VSampler's separate outputs show up as mixer channels
- **no soundcard conflicts:** since a plug-in lives within the sequencer, the sequencer is solely responsible for connecting to the soundcard

- **comfort:** instead of the numbers 0-127, the real names of the VSampler Instruments can be chosen from the sequencer's track properties
- **multiple instances:** if 16 simultaneously playable Instruments, 255 stereo Voices and up to 32 individual outputs aren't enough, just start another VSampler plug-in
- **total recall:** all Soundlibrary settings are saved together with the song and are automatically restored when the song is loaded

Conclusion:

By using VSampler as a plug-in (VSTi or DXi), you have the full comfort and perfect timing of an integrated virtual studio at your disposal.

### 2.2.3 ReWire



ReWire is not a plug-in format, but rather a synchronized audio/MIDI connection between two independently running programs. VSampler runs separate from the sequencer (e.g. [Live, Protools](#)), but ReWire still offers all but the last two of the above mentioned advantages of running VSampler as a plug-in.

ReWire also makes the audio output of VSampler's individual outputs available in the mixer of the connected sequencer (ReWire master). The output to the soundcard takes place exclusively through the ReWire master. Unlike the plug-in version, multiple instances of the Standalone version are not possible. So when VSampler is hooked up to your sequencer per ReWire, it is limited to 16 MIDI channels.

Conclusion:

If your sequencer does not support VSTi/DXi plug-ins, you should use ReWire to connect VSampler to your sequencer. Since programs connected per ReWire run independently, the performance on a multi-processor system can be better than when using VSampler as a plug-in.

## 2.3 Standalone-Version



By using all 16 MIDI channels (see basics on page 102) VSampler can play up to 16 different Instruments simultaneously.

Start VSampler using the Windows start menu:

Start → Programs → Speedsoft → VSampler 3

After the start, VSampler’s GUI appears on your screen. Since the operation of VSampler is the same whether the Standalone version or the plug-in version is used, further steps will be described together in the following chapters.

### Connecting to a MIDI sequencer

In order to connect the VSampler Standalone version to a classic MIDI sequencer e.g. [Cakewalk Pro Audio](#), [Band-In-A-Box](#), [Power Tracks Pro](#), [Sibelius](#) or [Finale](#), please proceed as follows:

- if you have not yet done so, install the included virtual MIDI cable, see “5.3.2. Setting up the virtual MIDI cable” on page 84.
- start your sequencer and VSampler
- create a new MIDI track in your sequencer, or assign an existing track to the output device “SpeedSoft MIDI cable 1”

In order for VSampler to know which track belongs to which Instrument, assign a unique MIDI channel number (1 to 16) to each track.



The SpeedSoft MIDI cable receives data from any MIDI sequencer. However, it only sends data when the other end is connected to a Speedsoft Instrument.

This avoids operational errors and MIDI feedback loops.

## 2.4 VSTi/DXi Plug-in

By using all 16 MIDI channels (see basics on page 102) each opened VSampler plug-in can play up to 16 different Instruments simultaneously. To do this, assign the output of several tracks to VSampler. Set each of these tracks to a different MIDI channel. You can also open several instances of the VSampler plug-in, in order to increase the available number of MIDI channels by another 16 channels for each additional VSampler plug-in.



The OEM version “VSampler 3.0 DXi” includes the DXi-plug-in, but not VSTi plug-in, ReWire, Standalone version and virtual MIDI cable. If you like, you can purchase them as an upgrade, see “1.5. OEM Version vs. Independent Version” on page 20.

In order for VSampler to know which Instrument belongs to which track, two settings must be made in the track properties of the sequencer:

- a unique MIDI channel number (1 – 16) must be assigned for each track
- the respective VSampler Instrument must be selected for each track



The Instrument selection ("program change") is always sent per MIDI channel, and not per sequencer track!

For each sequencer track both the Instrument and the MIDI channel must be set, otherwise all tracks would play the same VSampler Instrument (see “6.2.4. Sequencer tracks vs. MIDI channels” on page 103).

After you have gotten somewhat used to VSampler, you should read "4.4.2. Decision: Assign Instruments in Sequencer or in VSampler?" on page 66. Here is where it's explained how to assign Instruments to corresponding MIDI channels directly in VSampler. This method is significantly faster than changing the track properties in the sequencer, particularly when you are comparing Instruments.

In the following sections, it is explained how to connect VSampler to your sequencer in order to play back several tracks at once. You can skip these sections if you already have experience with other multitimbral plug-ins. If you are using a different sequencer than in the examples below, please take a look in

documentation of your sequencer about how to integrate a plug-in as the output device of a MIDI track.

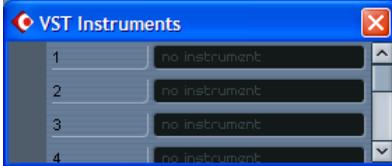
After the start, VSampler’s GUI appears on your screen. Since the operation of VSampler is the same whether the Standalone version or the plug-in version is used, further steps will be described together in the following chapters.

### 2.4.1 Setting up the VSTi plug-in in Cubase SX



This description applies to Steinberg’s Cubase SX – however, the steps are similar in other VSTi compatible sequencers.

- start Cubase SX and load a project
- pull down the “Devices” menu, and click on “VST instruments”



- in the list of your VST instruments, select “VSampler 3”:



- the VSampler GUI opens automatically - if the startup Soundlibrary “startup.vs3” is not automatically loaded, load it by pulling down VSampler’s “File” menu and selecting “Open”
- create a new MIDI track (right mouse button “Add MIDI Track”), or assign an existing track of your song to the output device VSampler („out : VSampler 3“):



- select a track for a MIDI channel (“chn: 1” is the default) and an Instrument from the loaded Soundlibrary (“euro”)

Now you can play VSampler using your MIDI keyboard or the on-screen virtual keyboard. You can create further MIDI tracks for the common output device “VSampler 3” in order to play up to 16 different VSampler Instruments. In order to get a better view of the track properties, you should widen the window.



Make sure that each track is set to a different MIDI channel number (“chn: 2”, “chn: 3” etc.). You can now assign Instruments from the current VSampler Soundlibrary to other tracks (“prg : ...”).

After clicking the “Edit” button of the “VST instruments” dialog, the VSampler GUI appears on your screen. Since the operation of VSampler is the same

whether the Standalone version or the plug-in version is used, further steps will be described together in the following chapters.

## 2.4.2 Setting up the VSTi plug-in in Cubase VST



This description applies to Steinberg’s Cubase VST – however, the steps are similar in other VSTi compatible sequencers.

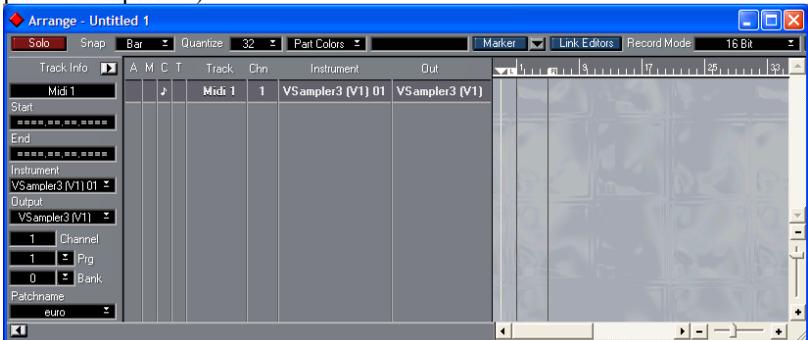
- start Cubase VST and load a project
- pull down the “Panels” menu, and click on “VST Instruments”



- in the list of your VST instruments, select “VSampler 3”:



- click the “Edit” button in the “VST Instruments” dialog in order to open the VSampler interface. If the standard Soundlibrary “startup.VS3” does not open automatically, open it using VSampler’s menu “File | Open”
- create a new MIDI track (pull-down menu “Structure | Create Track”) or assign an existing track of your song to the output device VSampler (Output “VSampler 3”)



- select a track for a MIDI channel (Channel 1 is the default) and an Instrument from the loaded Soundlibrary (Patchname “euro”)

## Start

Now you can play VSampler using your MIDI keyboard or the on-screen virtual keyboard. You can create further MIDI tracks for the common output device “VSampler 3” in order to play up to 16 different VSampler Instruments.



Make sure that each track is set to a different MIDI channel number (Channel 2, 3, etc.). You can now assign Instruments from the current VSampler Soundlibrary to other tracks (Patchname ...).

After clicking the “Edit” button of the “VST Instruments” dialog, the VSampler GUI appears on your screen. Since the operation of VSampler is the same whether the Standalone version or the plug-in version is used, further steps will be described together in the following chapters.

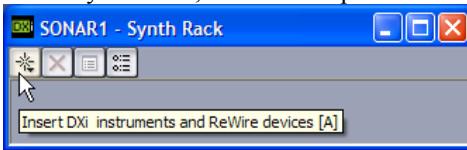
### 2.4.3 Setting up the DXi plug-in in Sonar

This description applies to Cakewalk Sonar 2 and 3 – however, the steps are similar in other DXi compatible sequencers.

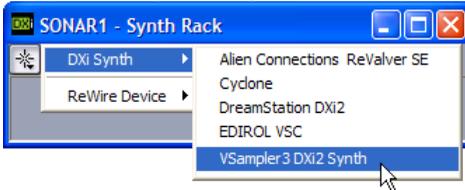
- start Sonar and load a project
- in the Sonar toolbar, click the small DXi button to open the Synth Rack:



- In the Synth Rack, insert VSampler...



- ... by selecting “VSampler 3 DXi2 Synth“ from your list of DXi’s:



- select the options as shown in the screenshot to create the MIDI and audio track for VSampler:



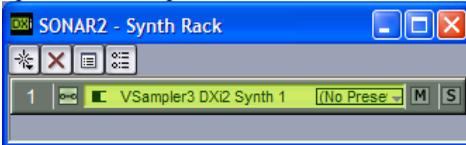
If you want several individual outputs, select “All Synth Outputs (Audio)”, see also “4.5. Using Separate Outputs” on page 70.

- Sonar has now created two tracks. The **MIDI track** sends MIDI data to the output device VSampler, die **Audio track** receives the audio signal from the input device VSampler:



## Start

- double-click the “Edit” button in the “VST instruments” dialog in order to open the VSampler GUI:

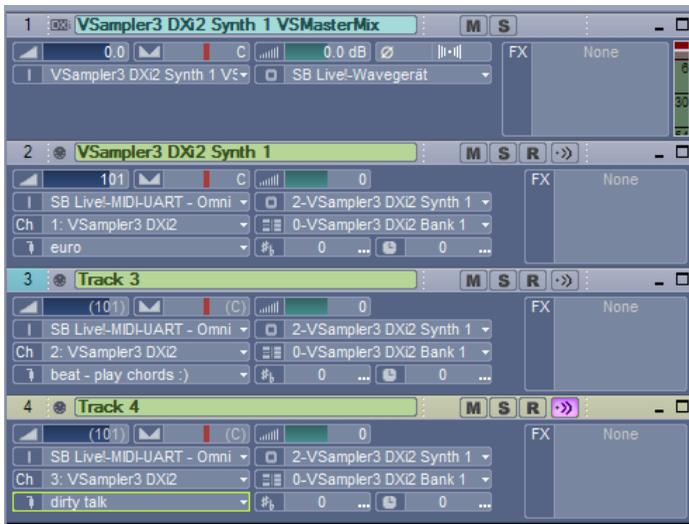


→ if the standard Soundlibrary “startup.VS3” does not open automatically, open it using VSampler’s menu item “File | Open”

- expand the MIDI track so that you can see the track properties; choose a MIDI channel ("Ch 1: ...") and an Instrument from the loaded Soundlibrary (“euro”)



Now you can play VSampler using your MIDI keyboard or the on-screen virtual keyboard. You can create further MIDI tracks (right mouse button “Insert MIDI Track”) for the common output device “VSampler 3”, in order to play up to 16 different VSampler Instruments:



In order to playback existing MIDI tracks with VSampler, you have to set the output device to VSampler for each track (in the right column). Make sure that each track is set to a different MIDI channel number (Ch 2, 3, etc.). You can now assign Instruments from the current VSampler Soundlibrary to the other tracks.

After double-clicking the VSampler rack module in Sonar's Synth Rack, the VSampler GUI appears on your screen. Since the operation of VSampler is the same whether the Standalone version or the plug-in version is used, further steps will be described together in the following chapters.

## 2.5 ReWire

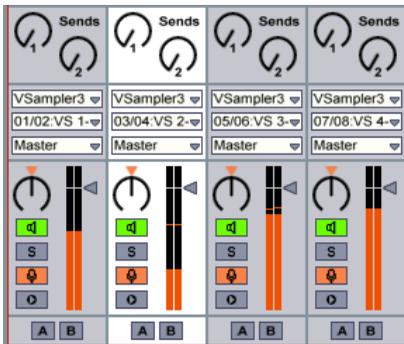


By using all 16 MIDI channels (see basics on page 102) VSampler can play up to 16 different Instruments simultaneously. To do this, set your keyboard's MIDI out to an appropriate MIDI channel, or the MIDI outs of several keyboards or sequencer tracks to different MIDI channels.

Connecting the sequencer (master) to VSampler (slave):

- first start your sequencer
- then start the Standalone version of VSampler using the Windows start menu: Start → Programs → Speedsoft → VSampler 3
- when asked “Do you want to start VSampler in ReWire mode?” answer “yes”

After the start, VSampler's GUI appears on your screen. In the sequencer, assign the output device of the desired MIDI tracks to “VSampler 3 ReWire,” and/or activate VSampler as input device for the desired number of audio tracks. If your sequencer only supports audio tracks per ReWire, you can use the included virtual MIDI cable (see “5.3.2. Setting up the virtual MIDI cable” on page 84) for the MIDI connection.



VSampler's individual outputs in the Ableton Live mixer

Since the operation of VSampler is the same whether the Standalone version or the plug-in version is used, further steps will be described together in the following chapters.

## 3 Graphic User Interface (GUI)

### 3.1 Typical Control Elements

#### Context sensitive help

For every control element and every area of the GUI, VSampler offers context sensitive help. To get help, click the question mark in the VSampler title bar:



A little question mark is now attached to your mouse pointer. Then click on the control element that you want help with. You can access the entire help file by opening the “Help” menu or by pressing the “F1” key. In order to search the help file for a particular word, click on the “Index” tab and enter the first letters of the word you’re looking for.

#### Multi-Language

In the menu “Options | Environment” you can switch the GUI and help file languages. Currently, English and German are available.

#### Context menus (right mouse-click)

VSampler offers numerous menus which are dependent on the situation. A right mouse click will show you on the spot which further actions or settings are available for the selected item. By using the right mouse button, for example, you can set-up a fader or a switch for the remote control per external MIDI controller, or you can switch a tempo-related knob between Hz and BPM.

#### Less is more

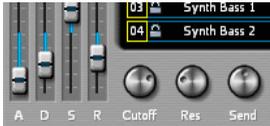
VSampler supports the workflow principle “less is more.” The GUI is adaptable to your individual way of working. There is an extra chapter devoted to this subject, see 3.3. on page 41.

### Fine tuning per Shift key

Holding down the “Shift” key puts VSampler’s controllers into fine-tuning mode. In this mode, the controllers move significantly slower, so that even small knobs can be gradually adjusted in single steps.

### Knobs and faders

The value of a knob or a fader can be changed in a number of ways:



- with the mouse, by moving it up or down (Shift key for fine tuning)
- with the mouse wheel after having selected the controller element (Shift key for fine tuning)
- with a double-click, to reset the controller element to its default value
- per MIDI remote control or VST automation, see the VSampler Reference Manual

Some knobs offer additional options which are displayed per context menu (right click), for example remote control, or switching the type of unit shown.

### Range sliders

These special faders (Editor View) allow to set a value range, they can be changed in a number of ways:

- with the mouse, by moving it up or down (Shift key for fine tuning) click in the middle of an area to move it, or at the top or bottom end to change one of the two values
- with the mouse wheel, to widen or narrow the range after having selected the controller element (Shift key for fine tuning)
- with a double-click, to reset the full range
- per MIDI remote control or VST automation, see the VSampler Reference Manual



### Dropdown boxes



Dropdown boxes offer a selection between various possibilities, here for example, the possible types of a sample loop (Editor View). The entries, if not predefined by VSampler, can be renamed per double-click (for example, the list of Zones of an Instrument).

## Numerical fields

Smooth 9 ms Numerical fields such as this one for smoothing a loop (Editor View) include the same functions as knobs. The value can be changed in a number of ways:

- with the mouse, by moving it up or down (Shift key for fine tuning)
- by clicking on the up/down elements to change the value in single steps
- with the mouse wheel after having selected the numerical field
- per double-click, to type in a value

## Text fields

The content of a text field can be renamed by double-click, for example to change the names of the Instruments in the Instruments Pool:



## Transparent GUI

To prevent operational errors, the graphic display lets you visualize the status of the sound engine. VSampler does this by blending out controller elements that are currently inactive. If for example only two of the maximum three channel effects are activated, then the third knob will be blended out:



Here is an example from the filter page of the Editor View: without having set the filter frequency or resonance as a target for the filter envelope, altering the envelope points wouldn't result in any audible effect. That's why VSampler won't let you do it:



no filter activated



Filter activated, but no target for the envelope yet



Filter envelope targeting frequency and resonance

## 3.2 Drag & Drop

VSampler offers numerous drag & drop functions:

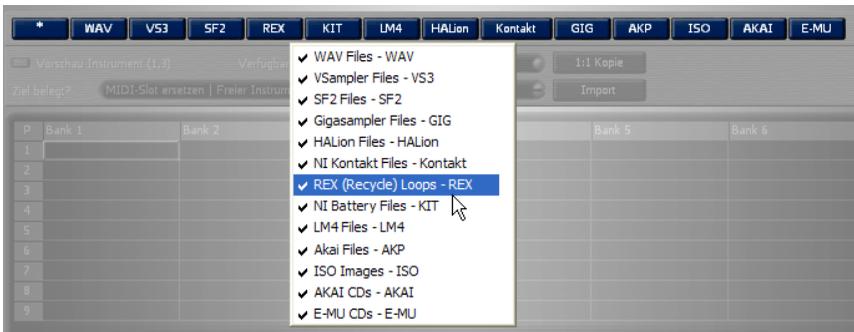
- **Loading a Soundlibrary:**  
drag a Soundlibrary file from the Windows Explorer into the VSampler Instruments Pool
- **Adding further Instruments (importing):**  
drag a file from the Windows Explorer or from the VSampler Quickbrowser (Editor View, see Reference Manual) or drag an Instrument from the VSampler Import Window onto a free slot in the Instruments Pool, or directly onto a MIDI channel
- **Assigning an Instrument to a MIDI channel:**  
drag a file from the Windows Explorer or drag an Instrument from VSampler's Instruments Pool or Import Window onto a MIDI channel
- **Assigning a Sample to a keyboard key:**  
drag a WAV or AIF file onto a key of the on-screen keyboard
- **Copying and moving Instruments:**  
in the Instruments Pool, drag an Instrument onto an empty slot, for more information see "Instruments Pool" on page 49
- **Merging Instruments:**  
in the Instruments Pool, drag an Instrument onto a slot which is already occupied by another Instrument
- **Copying Zones of an Instrument into other Instruments:**  
copy or move Zones from the Quickbrowser into other Instruments of the Instruments Pool
- **Changing the order of Zones**  
in the Zone View of the Quickbrowser (Editor View, see Reference Manual) drag a Zone to another position on the list

### 3.3 Less is more

VSampler supports the workflow by the “less is more” principle. The buttons of unused function groups can (and should) be hidden using the context menu (right mouse button). What may sound trivial in theory is in practice quite useful.

#### File types in the Import Window

If you don’t own any Instruments of a particular file type, just hide the corresponding button:



Your personal variation for example might look like this:



#### Editor View, pages of the Main Window



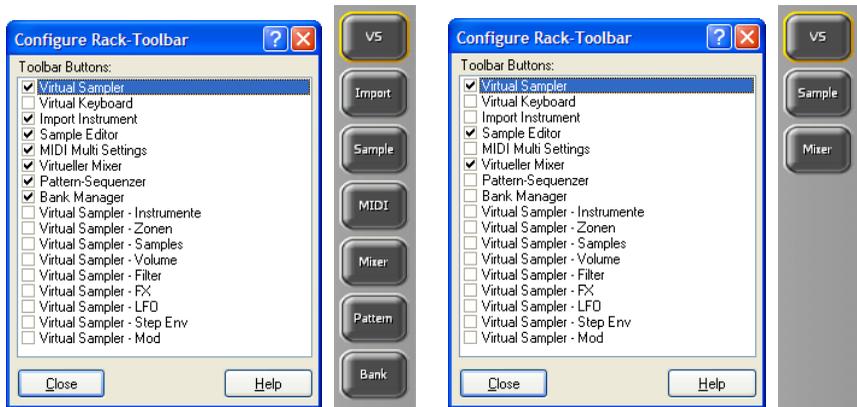
The buttons for the separate pages can also be hidden if you don’t need them. Your personal variation for example might look like this:



#### Editor View, Toolbar

In the Editor View, the number and order of buttons of the toolbar on the right side of the VSampler window can be adapted to your own personal preference. These buttons are for switching between the separate Racks of the Editor View. To adapt the toolbar, click on it with the right mouse button and choose the menu item “Configure Rack-Toolbar.”

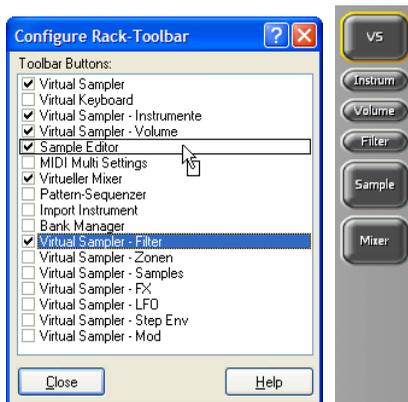
## Graphic User Interface (GUI)



default setting

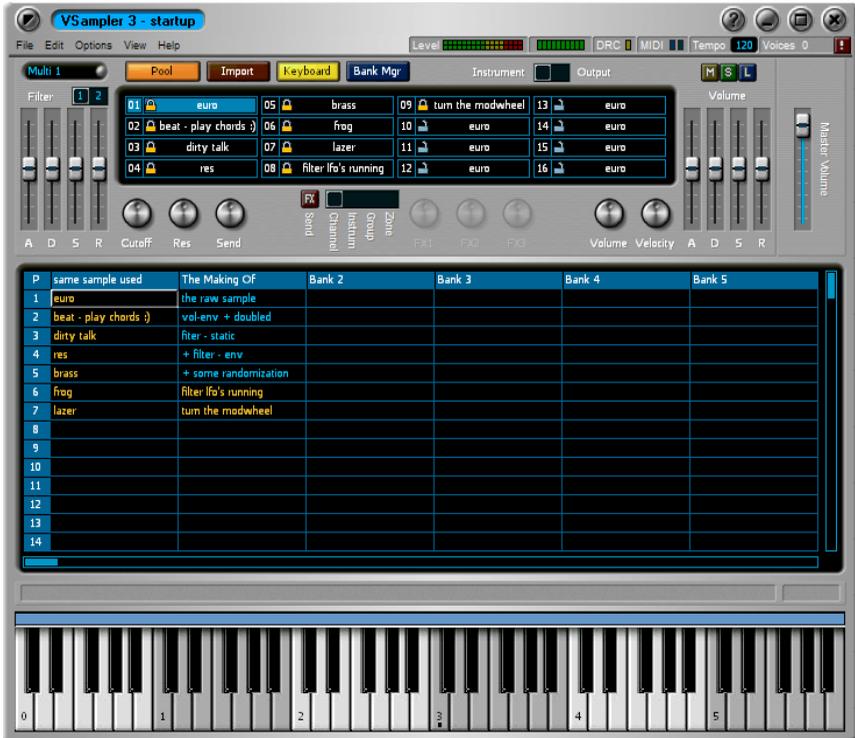
...adapted: just Main Window, Sample Editor, Mixer

Smaller buttons for the individual pages of the Main Window can also be added to the toolbar – the order of the buttons can be changed per drag & drop:



### 3.4 The Small View

VSampler presents itself in the Small View when started for the first time. It automatically loads the Soundlibrary “startup.vs3”. Loading and importing other sounds is described in the sections “4.2. Loading a Soundlib” on page 58 and “4.3. Importing Instruments” on page 59.



16 MIDI channels (top) + Instruments Pool (middle) + on-screen keyboard (bottom)

The Small View offers everything to load, arrange and play back Soundlibraries and Instruments. Also, it offers the most important settings for volume, filters and effects. In order to edit all Instrument details, experts can switch to the Editor View at any time (menu item “View”). For now, please stay in the Small View. It consists of 4 screen areas:

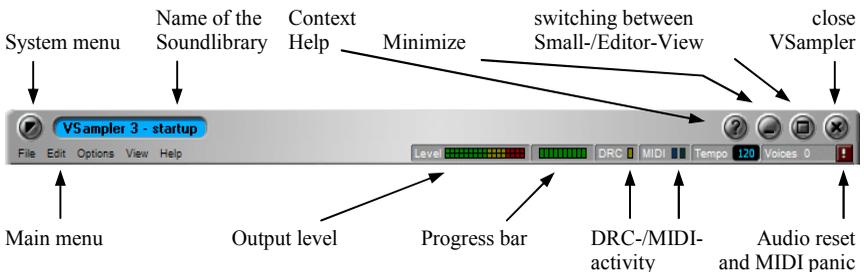
## Graphic User Interface (GUI)

- Part 1: the **Title bar** includes the main menu, a few status displays as well as buttons for “Help” and “MIDI panic” among others
- Part 2: **16 MIDI channels** and controllers for important Instrument settings, the slots can be switched to display **Instrument Names** or **output devices**
- Part 3: switchable between **Instruments Pool** (shows all loaded Instruments) and **Import Window** (shows the content of the last file selected for import)
- Part 4: **On-screen keyboard**, always plays the Instrument of the current MIDI channel

The “Bank Mgr” button is for opening the Bank Manager which is used to manage extensive sound libraries.

### 3.4.1 Title bar and Status displays

The title bar is visible in every VSampler view. The elements on the top row of the bar may vary graphically depending on the host sequencer.



The elements of the top row are pretty much self-explanatory - for more details please see VSampler’s context help. The elements of the lower row:

- **Output level:** displays the Master level, i.e. the sum of all output signals; it can be activated/deactivated by double-click
- **Progress bar:** displays the progress of time-consuming operations
- **DRC activity:** blinks as soon as DRC meshes with the memory management see “6.5. Dynamic Resource Control (DRC)” on page 112)

- **MIDI activity:** blinks as soon as a MIDI message is received or sent, applies to all available MIDI devices and channels
- **Tempo:** shows the current song tempo in BPM (Beats Per Minute) as determined by the VSTi/DXi/ReWire sequencer, or can be entered manually in the Standalone version by double-click
- **Voices:** shows the number of active Voices, can be switched between Note Voices and Zone Voices by right mouse key, see “6.6.2. Counting Voices” on page 114
- **Audio reset and MIDI panic:** stops all active Voices and resets all audio and MIDI devices

### 3.4.2 MIDI channel slots and controllers

(Compact variation of the "MIDI Rack" in the Editor View)

The 16 slots correspond to the classic 16 MIDI channels, see basics on page 102. On these VSampler can simultaneously play back 16 different Instruments on 16 different output devices.

Instruments can be played per on-screen keyboard, sequencer or MIDI keyboard. As soon as VSampler receives MIDI signals, the number of the MIDI channel receiving data lights up briefly.

Annotations for the MIDI Rack interface:

- choose current Multi
- show either Instruments Pool or Import Window
- show on-screen keyboard
- show Bank-Manager
- show either Instrument names or Output devices
- Mute, Solo, Limiter
- Filter envelope cutoff, resonance, send
- effect sends for Channel Instrument, Group, Zones
- volume, velocity-sensitivity, envelope
- Master level

Explanation of the individual elements:

- **Choose Multi:** switches between sets of Instrument-assignments for the 16 MIDI channels, see "6.4.5. Multi" on page 112, using the context menu (right mouse button) you can reset or copy a Multi
- **Pool / Import:** Switches the display between the **Instruments Pool** (shows all loaded Instruments) and the **Import Window** (shows the content of the last file selected for import), see next chapter
- **Keyboard:** shows the VSampler on-screen keyboard, see the chapter after next
- **Bank Mgr:** opens the VSampler Bank Manager window
- **Instrument / Output switch:** switches the display of the 16 MIDI channel slots between the name of the assigned **Instrument** and the name of the assigned **Output device**
- **Mute, Solo, limiter:**
  - Mute: mutes the currently selected MIDI channel
  - Solo: mutes all other channels
  - Limiter: limits volume peaks to 0 dB
- **Filter:** is only shown when the Instrument includes an active filter – changes the filter settings relative to the original settings of the Instrument – for more details see the VSampler context help or the Reference Manual
- **Effects:** the “FX” button lights up when at least one effect is activated at the level selected by the range slider (Channel, Instrument, Group, Zone) – by clicking the “FX” button, the effect parameters can be changed on the Channel- and Instrument-level, or effects can be added and/or deleted:



Depending on the number of activated effects at the selected FX level, the knobs for controlling effect strength will be blended in; their effect is relative to the original settings of the Instrument - for more details see the VSampler context help or the Reference Manual.

- **Volume:** changes the volume settings relative to the original settings of the Instrument, for more details see the VSampler context help or the Reference Manual
- **Master level:** changes the master volume of VSampler, pay attention to the level display on the title bar to avoid clipping

## **The MIDI channel slots**

The various functions of the MIDI channel slots:

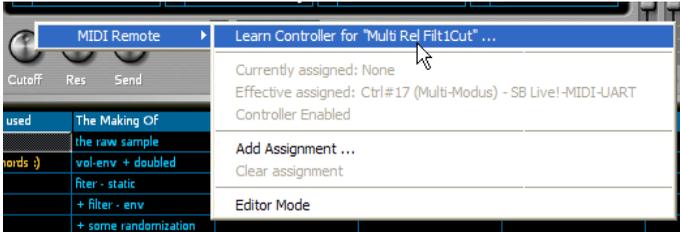
- **Assigning an Instrument from the Windows Explorer:**  
drag & drop a sound file (Soundlibrary, Instrument, Sample) onto a MIDI channel slot
- **Assigning an Instrument from the Pool (four variations):**
  - drag & drop an Instrument onto the MIDI channel slot
  - double-click the MIDI channel slot, and choose another Instrument
  - to quickly compare Instruments: using the + (plus) and – (minus) keys of the numerical keyboard, you can switch one Instrument forwards and backwards
  - to quickly compare Instruments: open the padlock symbol of the MIDI channel with a double-click, and step through the Pool using the cursor keys, the currently selected Instrument is automatically loaded to all opened MIDI channels and can be heard in the song
- **Assigning an Instrument from the Import Window:**
  - drag & drop an Instrument onto the MIDI channel slot
  - to quickly compare Instruments even before importing: open the desired MIDI channel slot, and step through the Instruments using the cursor keys, the currently selected Instrument is automatically loaded to all opened MIDI channels and can be heard as a preview Instrument in the song
- **Changing the output device:**  
double-click the MIDI channel slot, and choose another output device, for more information how to use VSampler’s individual outputs see chapter 4.5. on page 70
- **Switching between “Hard-wired” / “play selected Instrument”:**  
double-click the padlock symbol (see 4.4.1. on page 65)

With the context menu (right mouse button) the Instrument Options can be displayed and changed, e.g. the polyphony of an Instrument (see “5.4.2. Limiting polyphony - background” on page 87). For more information, see the VSampler Reference Manual.

## **The controllers**

The controller settings for filter/effects/volume always affect all Zones of the Instrument of the currently selected MIDI channel. Since their effect is relative to the Instrument settings, a possible difference between Zone settings is retained.

With a right mouse click on a VSampler controller, you can access the “Learn Controller” function which enables remote control by a MIDI controller:



remote control of the relative filter cutoff by MIDI controller

Just a wiggle of your MIDI controller is all VSampler needs to recognize the controller number, which right away controls the selected VSampler controller.



In the screenshots, all controllers are set to the middle position. This does not mean that all parameters have a mid-range value, but rather that the Instrument is being played back with the parameters at the original values set in the Instrument. From this starting point, the values can be raised or lowered.

### 3.4.3 Instruments Pool

With the “Pool” and “Import” buttons, the middle part of VSampler’s Small View can be switched between the Instruments Pool and the Import Window – or it can be blended out entirely. Here is where you manage your Instruments, which you can then drag & drop onto the 16 MIDI channels.



The Instruments Pools and the Import Window look similar, but they have entirely different functions:

**Pool:** shows the content of the **current** Soundlibrary, i.e. all currently loaded Instruments

**Import:** shows the content of an **external file**, whose Instruments can be imported into the Pool (i.e. the current Soundlibrary)

## Instruments Pool

(Compact variation of the "Instruments" page of the Editor View)

The Instruments Pool represents the entire content of the current VSampler Soundlibrary (see 6.4.1. on page 109), i.e. all currently loaded Instruments (see 6.4.2. on page 109). These conform to the GS<sup>1</sup> standard, and are arranged in 128 rows (programs) and 128 columns (banks), which means a maximum of 16384 Instruments.

P	same sample used	The Making Of	Bank 2	Bank 3	Bank 4	Bank 5
1	euro	the raw sample				
2	beat - play chords }	vol-env + doubled				
3	dirty talk	filter - static				
4	res	+ filter - env				
5	brass	+ same randomization				
6	frog	filter lfo's running				
7	lazer	turn the modWheel				
8						
9						
10						
11						
12						
13						
14						

Instruments Pool: divided into 128 rows (programs) and 128 columns (banks)

When building your own Soundlibraries, you can organize your Instruments however you please, for example visually, in order to keep your Instruments in clear view. A typical way of sorting is to put different Instruments in a vertical column, and variations of Instruments in the horizontal rows. Or the Instruments can be sorted in categories placed in columns: all guitars in column 1, all pianos in column 2 etc.

VSampler supports “program change” and “bank change” MIDI messages, which enables the Instrument of a MIDI channel to be switched by sequencer or keyboard.

<sup>1</sup> Roland GS standard: General Synthesizer standard, broadens the GM (General MIDI) standard to include the “Bank Change” command, which enables to switch between different versions of an Instrument.



Don't get mixed up by the word "Bank" or "Soundbank": generally it refers to the entire Soundlibrary, whose Instruments are arranged in MIDI **bank** numbers from 0 to 127.

The numbered bank columns in the Instruments Pool correspond to these MIDI bank numbers **within** the Soundlibrary. A "bank change" message thus switches between and selects Instruments that are in the same row of each other in the Pool. You can't load a different Soundlibrary file (e.g. SF2) in each of VSampler's bank columns. Instead, any Instrument from any Soundlibrary file can be added to any slot of the current VSampler Soundlibrary, by using the Import Window.

The possible actions in the Instruments Pool:

- **Loading a Soundlibrary, Instrument or Sample:**  
drag & drop a sound file from the Windows Explorer into the Pool
- **Assigning an Instrument to a MIDI channel:**
  - drag & drop the Instrument onto a MIDI channel slot
  - to quickly compare Instruments: using the + (plus) and – (minus) keys of the numerical keyboard, you can switch one Instrument forwards and backwards
  - to quickly compare Instruments: open the padlock symbol of the desired MIDI channel by double-click, and roam through the Pool using the cursor keys, the currently selected Instrument is automatically loaded to all opened MIDI channels and can be heard in the song
- **Renaming bank columns:**  
double-click the column heading, to give a column an expressive name
- **Renaming Instruments:**  
double-click on the name of the Instrument
- **Selecting more than one Instrument:**
  - **Shift Key:**  
click on Instrument A and then with the shift key pressed on Instrument B to select all Instruments from A to B
  - **Ctrl Key:**  
to add or remove Instruments from the selection, click on them with the Ctrl key pressed
  - **Selecting all Instruments of a row or column:**  
click on the row number or the column header
- **Copying and moving Instruments:**  
drag & drop one or several selected Instruments onto an empty slot and

choose the desired action from the pop-up context menu, or even more directly:

- **Copy (no pop-up question):**  
to make a direct copy hold the ctrl key while dragging
- **Move (no pop-up question):**  
to move an Instrument directly, hold the shift key  $\hat{u}$  while dragging the Instrument to the new position
- **Merging, swapping and replacing Instruments:**  
drag & drop an Instruments onto a slot that is already occupied by another Instrument, and choose the desired action from the pop-up context menu:
  - **Merge:** both Instruments are combined into one Instrument
  - **Swap:** the Instruments swap places
  - **Replace:** the dragged Instrument replaces the Instrument in the target slot

By using the context menu (right mouse button), all Instruments can be selected or deselected, or the selection can be inverted. It also allows you to change the Instrument Options, e.g. the polyphony of an Instrument (see “5.4.2. Limiting polyphony - background” on page 87). For more information, see the VSampler Reference Manual.

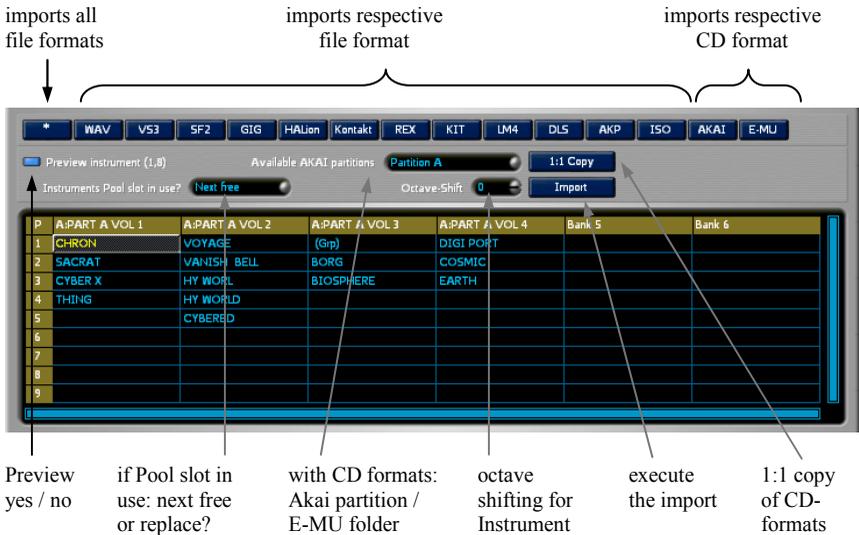
### 3.4.4 Import Window

(Compact variation of the "Import Rack" in the Editor View)

The Import Window allows you to import Instruments from a wide variety of sound formats, see “4.1 Supported Import Formats” on page 57. Instruments stemming from different sources can be added to the current Soundlibrary, see "4.3. Importing Instruments" on page 59. A Soundlibrary which is composed in this way can then be saved as a .VS3 file, for example as the Soundlibrary for a certain song or as a subject-specific Soundlibrary.

The Import Window always shows the content of the last external file selected to be imported. You can return to the Import Window at any time during work on your Soundlibrary or song. It maintains it's content until you select another file to be imported. This way, you can import Instruments as often as you like from an external file, without having to reopen it multiple times.

## Graphic User Interface (GUI)



The buttons for opening the various file formats (see 4.1. on page 57) are at the top of the Import Window area. Each of these buttons remembers the directory last used for it's file type. After clicking a file type button and selecting an external file, it's content will then be displayed in the import window. Further steps for importing an Instrument to a specific MIDI channel can be found at "4.3. Importing Instruments" on page 59.

Here is a description of the options shown in the above screenshot:

### Preview Instrument

If this option is activated, then the selected Instrument will be automatically loaded to all opened MIDI channels for previewing. Note: this does not actually import it into the Instruments Pool yet. You can play it right away with a keyboard or by the sequencer and hear it in the song. At this point, you can step through the Instruments of the external file using the cursor keys, and compare and contrast them before deciding which ones to import.

The Preview Instrument will be permanently imported into the Pool (i.e. the current Soundlibrary) by clicking the "Import" button or by double-clicking it in order to actually import it. Until this is done, you can continue to test further Instruments as described above. Keep in mind that as soon as you click on an-

other Instrument, the previous Preview Instrument will be deleted and replaced by the new one.

### **Instruments Pool slot in use?**

Importing brings the new Instrument into the Pool. If the Instrument slot is already occupied by another Instrument, you can determine here whether or not it should be replaced:

- **Next free:** the new Instrument is imported to the next free slot in the Pool that VSampler finds
- **Replace:** the new Instrument replaces the previous Instrument of the slot

Which of the two options is best depends upon whether you prefer to select your Instruments in the track properties of your sequencer, or to make your changes in VSampler's MIDI channel slots directly, see "4.4.2. Decision: Assign Instruments in Sequencer or in VSampler?" on page 66.

The position of the current Instrument slot (Bank, Program), where the Instrument will be imported to, is shown in brackets behind the text "Preview Instrument". In the default setting "next free" you don't have to pay any attention to it.

### **Available Akai partitions / E-MU folders:**

Here you can select the partition (Akai) or the folder (E-MU) of the respective CD formats that you want to have displayed in the Import Window. Typically these CDs consist of several partitions or folders in which the Instruments are arranged.

### **Octave-Shift**

Here you can shift the position of an Instrument on the keyboard by +/- 2 octaves before you import it, to fit it to the range of your other Instruments.

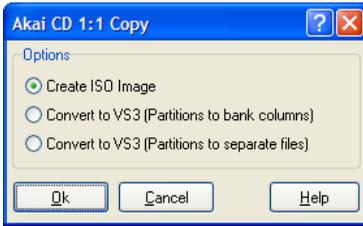
### **"Import" button**

Clicking on the "Import" button causes the selected Instrument to be actually imported from the Import Window into the Pool (i.e. the current Soundlibrary) and also locks the MIDI channel (see "4.4.1. The MIDI channel's padlock symbol" on page 65).

### **1:1 Copy**

Here you can copy the content of an Akai<sup>TM</sup> or E-MU<sup>TM</sup> CD onto your hard disk, so that in the future you won't need to insert and change your CDs. Your entire collection of Akai<sup>TM</sup> and E-MU<sup>TM</sup> CDs can be accessed quicker and

more comfortably this way. After clicking on the “1:1 Copy” button, you have your choice between three variations:



- **ISO Image:** creates a disk image file from which VSampler can read the Instruments just like from other Soundlibrary formats.
  - *Advantage:* the CD’s compatibility with other samplers is retained<sup>1</sup>, the data is not converted to another format, but copied 1:1
  - *Disadvantage:* bypasses DRC (see 6.5. on page 112), i.e. enough memory must be available, on the other hand Instruments with this format have a max. size of just 32 MB
- **VS3 (bank columns):** the entire CD is converted into one single .VS3 file, the partitions and volumes of the CD become bank columns.
  - *Advantage:* can be used with DRC, faster loading (important especially when using the Preview Instrument feature)
  - *Disadvantage:* not compatible with other samplers
- **VS3 (separate files):** for each partition of the CD, a separate .VS3 file is created, the volumes of the CD become bank columns
  - advantages + disadvantages: see above

The possible actions in the Import Window:

- **Selecting external files to be imported:**  
click on the file type button of the desired import format to open an external file in the Import Window and display the contained Instruments
- **Import an external file:**
  - single Instrument: double-click on the Instrument, or click on the “Import” button
  - several Instruments: select all of the desired Instruments, and click on the “Import” button
- **Assigning an Instrument to a MIDI channel:**

---

<sup>1</sup> With the help of e.g. Daemon Tools (Freeware, see <http://www.daemon-tools.org>), other software samplers can also access such a “virtual CD”.

- drag & drop the Instrument onto a MIDI channel slot
- to quickly compare Instruments even before importing: open the desired MIDI channel slot, and step through the Instruments using the cursor keys, the currently selected Instrument is automatically loaded to all opened MIDI channels and can be heard as a preview Instrument in the song
- **Selecting more than one Instrument:**
  - **Shift Key:**  
click on Instrument A and then with the shift key pressed on Instrument B to select all Instruments from A to B
  - **Ctrl Key:**  
to add or remove Instruments from the selection, click on them with the Ctrl key pressed
  - **Selecting all Instruments of a row or column:**  
click on the row number or the column header

Further steps for importing an Instrument to a specific MIDI channel can be found at "4.3. Importing Instruments" on page 59.

### 3.4.5 On-Screen Keyboard

(Compact variation of the “Keyboard Rack” in the Editor View)

The on-screen keyboard always plays the Instrument of the MIDI channel currently selected with the cursor (MIDI channel slot marked in blue). To play an Instrument on another MIDI channel, choose another MIDI channel slot with a mouse click.

Above the keys is a light blue bar representing the Zones of the Instrument, i.e. the mapping of Samples to keys:



The closer to the bottom edge of the key that you click, the higher the velocity value (top = 1, bottom = 127). You can test this with the first Instrument (“euro”) of the included Soundlibrary “startup.vs3.” The farther down that you click on the key, the brighter the sound.

**Assigning a Sample to a keyboard key:** drag & drop a WAV or AIF file from the Windows Explorer to a key of the on-screen keyboard. More details are explained in the VSampler Reference Manual.

With the context menu (right mouse button) the animated key display of incoming MIDI events and/or the alternating white/gray representation of the octaves can be activated or deactivated and the octave range of the on-screen keyboard can be changed.

### 3.4.6 Bank Manager

The Bank Manager is used to manage extensive sound libraries, independent of their location on a local hard disk or network. After you have entered your Soundlibraries in the Bank Manager, each Instrument can be assigned to various categories that can later be used as search criteria. How to enter and search for Instruments using the Bank Manager is described in detail in the VSampler Reference Manual.

You can immediately load any Instrument that has been entered in the Bank Manager to a MIDI channel slot, see 4.3.4. on page 64.

## 4 Operation

### 4.1 Supported Import Formats

3.1

OEM

Some of the import formats mentioned in this chapter are not available in the VSampler 3.0 OEM version, see “1.5. OEM Version vs. Independent Version” on page 20.

VSampler loads and imports Instruments in the following popular sampler formats: SF2™, ReCycle™, REX, Gigastudio™, HALion™, Kontakt™, DLS, AKAI™ (S1000/S3000 CD and S5000/S6000 .AKP files) and E-MU™ III / IV CDs, as well as Samples (WAV, AIF) and drum kits (LM4™, Battery™). You thus have a wide range of both free and commercial sounds at your disposal. All of the above formats can be played back in VSampler without an external conversion program.

These sampler formats can be divided into file formats and CD formats:

- **File formats:** files on a hard disk or network that can also be seen in the Windows Explorer
- **CD formats:** special CDs in hardware sampler formats (Akai or E-MU) that can't be seen in the Windows Explorer

#### File formats

(sorted by the order of the buttons in the Import Window)

- **WAV:** raw sample data (.WAV, .AIF), mostly single sounds or drumloops, resolutions of 16/20/24/32 bit in all sampling frequencies
- **VS3:** VSampler's native Soundlibrary formats: VSampler 3 Soundlibraries (.VS3), VSampler 3 Instruments (.VSI), compressed VSampler 3 Soundlibraries (.VS3), VSampler 2 Soundlibraries (.VSB)
- **SF2:** Creative Soundfont SF2™ Soundlibraries, widespread due to the popular Soundblaster Live! and Audigy series of soundcards
- **GIG:** Tascam Gigastudio™ Soundlibraries (.GIG)
- **HALion:** Steinberg HALion™ Soundlibraries (.FXB) + Instruments (.FXP)
- **Kontakt:** Native Instruments Kontakt™ Multis (.NKM) + Instruments (.NKI)

- **REX:** Propellerhead ReCycle™ (.RCY, .REX, .RX2), mostly drumloops
- **KIT:** Native Instruments Battery™ (.KIT), mostly drum kit Instruments
- **LM4:** Steinberg LM4/LM9™ (.TXT), mostly drum kit Instruments
- **DLS:** Downloadable Sounds (.DLS)
- **AKP:** Akai™ S5000/S6000 Instruments (.AKP)
- **ISO:** copy of an Akai or E-MU CD as an 1:1 disk image (.ISO, .BIN, .TAO, .IMG) – can be loaded in VSampler like a "normal" Soundlibrary from the hard disk

### CD formats

(sorted by the order of the buttons in the Import Window)

- **AKAI:** CD format of Akai™ S1000 / S3000 hardware samplers
- **E-MU:** CD format of E-MU™ III / IV hardware samplers

## 4.2 Loading a Soundlibrary

In order for VSampler to produce sound, a Soundlibrary, an Instrument or a Sample must first be loaded. This is done either with the menu item “File | Open” or per drag & drop from the Windows Explorer (see below for more details). When starting VSampler for the first time, the Soundlibrary “startup.vs3” is loaded automatically.

The term “Soundlibrary” refers to the entire content of VSampler. This includes all loaded Instruments and settings. Here are the two ways of loading a Soundlibrary:

### Menu “File | Open”

This menu item opens a new Soundlibrary. If the previous Soundlibrary has not been saved since the last change, VSampler asks if this should be done first. You can load numerous sound formats in VSampler, as mentioned in the previous chapter.



Opening a new file using the menu item “File | Open” removes the entire VSampler content and replaces it with the content of the newly opened file. To add further Instruments to your Soundlibrary instead of replacing all of them, use drag & drop or the Import Window (see next chapter).

## Drag & Drop

Drag & drop a Soundlibrary file from the Windows Explorer to an Instruments Pool slot. Choose “Load Soundlibrary” from the pop-up context menu. In order to add further Instruments to your Soundlibrary instead of replacing all of them, choose one of the two “import” menu items instead of “Load Soundlibrary”, or use the Import Window. Both options are described in the following chapter:

## 4.3 Importing Instruments

There is a significant difference between “Load Soundlibrary” and “Import”:

- **Load Soundlibrary:** replaces the entire Pool, i.e. all existing Instruments are removed and replaced by those in the new Soundlibrary
- **Import:** adds **further** Instruments to the Pool – all existing Instruments are retained

By Import, you can combine Instruments of various supported formats (see 3.4.6. on page 56) in one individual VSampler Soundlibrary and save all of them together as .VS3 file.

For the Import of file types with embedded Samples (e.g. SF2 and GIG) VSampler offers the possibility of loading the Samples into RAM, as long as the Soundlibrary has not yet been saved. This way Instruments up to a certain size can be imported into the current Soundlibrary, tested and removed, without the time consuming process of having the WAV files created from the embedded Samples during the import process. The size can be set in the menu “Options | Import” on the “General” tab.



There are four different ways to import Instruments:

- with the menu item “File | Import”
- Drag & Drop
- using the Import Window
- from the Bank Manager

The four methods in detail:

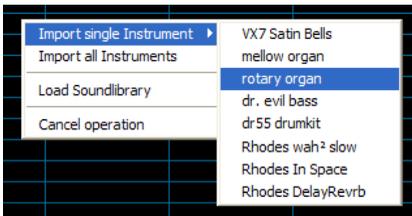
### 4.3.1 Importing per menu item “File | Import”

This menu item opens an external file (Soundlibrary or Instrument) to be imported, and presents it’s content in the Import Window. For all further steps, see “Importing using the Import Window” on page 60.

### 4.3.2 Importing per drag & drop

If you are familiar with your Instruments, and don’t need to preview them in the Import Window, this is the fastest way to load an external Instrument from the Windows Explorer directly onto a MIDI channel. It is automatically imported into the Pool as well. You can also drag the file onto a specific slot of the Pool.

If the file consists of more than one Instrument, VSampler offers three options in a pop-up context menu:



- **Import single Instrument:** imports **one** of the Instruments in the file
- **Import all Instruments:** imports **all** Instruments of the file
- **Load Soundlibrary:** has the same function as the menu item "File | Open", see previous chapter "Loading a Soundlibrary".

The difference between "Load Soundlibrary" and "Import" is described at the beginning of this chapter.

### 4.3.3 Importing using the Import Window

To quickly import single Instruments, the previously described method of drag & drop is faster and more direct than using the Import Window. The Import Window however offers the most comfortable way to listen to and compare your sound files. When the option “Preview Instrument” is activated (default setting) you can step through the Instruments of an external file using cursor keys or mouse, and play them on the keyboard or hear them in the song.



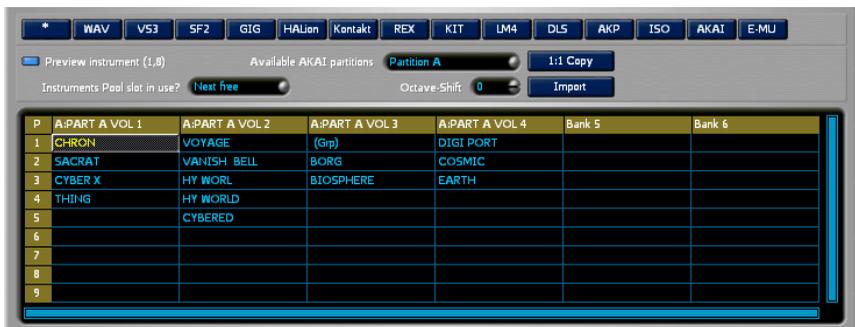
“Preview Instrument” and “Instruments Pool slot in use?” options

The layout of the Import Window as well as the function of all of it’s buttons and options have been described in chapter 3.4.4. on page 51.

The individual steps:

- Select the desired **MIDI channel slot** for playback of the new Instrument and open it by double-clicking the padlock symbol.
- If you want the new Instrument to be imported to a specific slot in the Pool (otherwise VSampler will automatically search for the next free slot): switch to the Instruments Pool by clicking the “Pool” button, and select the **Instruments Pool slot** for the new Instrument. You can re-organize and clean up the Pool at any time by moving the Instruments to different positions per drag & drop.
- Switch to the Import Window by clicking the “Import” button, and click the button corresponding to the file type you wish to import, and select the file.

The Import Window now shows all Instruments contained in the chosen file:



after clicking the "AKAI" button, the Instruments of an Akai CD are presented

You now have the choice of either importing the Instruments immediately (without previewing them) or first sorting out the Instruments you don’t need and then importing the rest (with preview):

### **Without preview:**

(deactivate the LED “Preview Instrument”)

- Select one or several Instruments.
- Finish the import by clicking on the “Import” button.

This will cause the selected Instruments to be added to the Pool (i.e. the current Soundlibrary). When the VSampler Soundlibrary is saved, the imported Instruments will be permanently part of it.

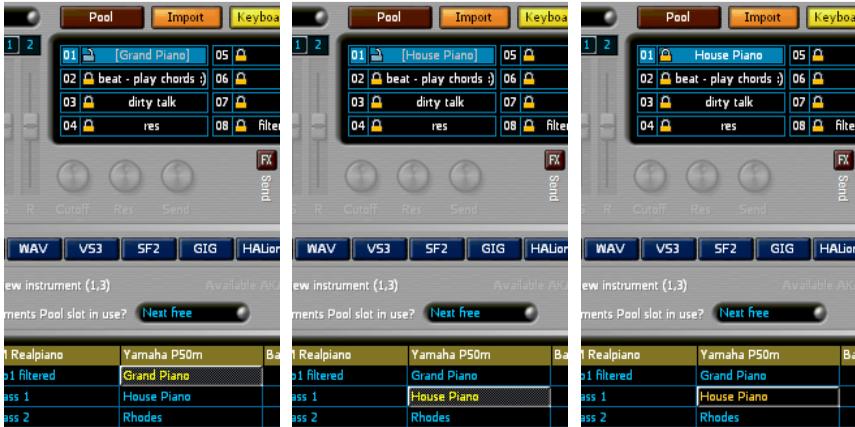
### **With preview:**

(default setting, LED “Preview Instrument” is activated)

This option allows you to compare Instruments of an external file before actually importing them, so that you can import only the Instruments that you need. The currently selected Instrument will be automatically loaded to all opened MIDI channels for previewing. Note: this does not actually import it into the Instruments Pool yet. You can play it right away with a keyboard or by the sequencer and hear it in the song. At this point, you can step through the Instruments of this external file using the cursor keys, and compare and contrast them before deciding which ones to import.

The Preview Instrument will be permanently imported into the Pool (i.e. the current Soundlibrary) by clicking the "Import" button or by double-clicking it in order to actually import it. Until this is done, you can continue to test further Instruments as described above. Keep in mind that as soon as you click on another Instrument, the previous Preview Instrument will be deleted and replaced by the new one.

The two typical steps are illustrated in the following screenshots: first **Preview** (“Grand Piano” in the left screenshot, and “House Piano” in the middle screenshot), then **Import** (“House Piano”):



first previewing “Grand Piano” and “House Piano”, then importing “House Piano”

Both steps in detail:

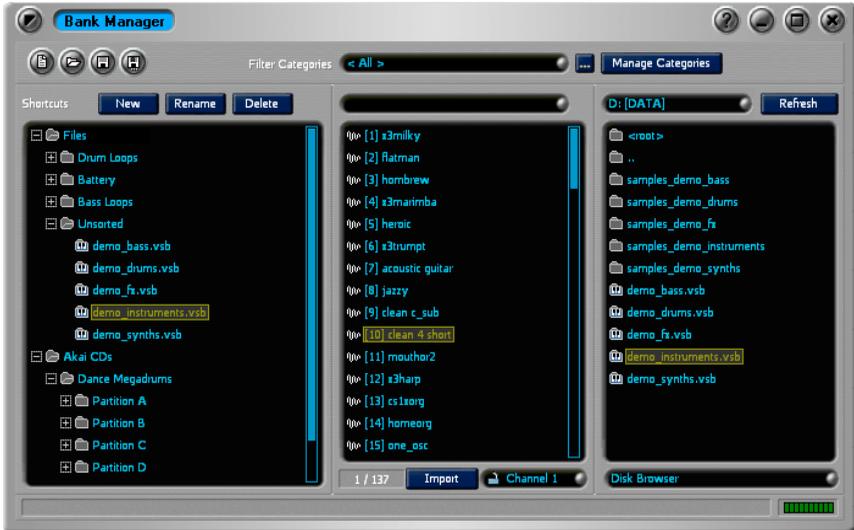
- **Preview:** Step through the Instruments by using cursor keys to compare possible candidates. The Instrument under the cursor is automatically loaded to all opened MIDI channels and can be heard in the song. Until it is imported, it will be displayed gray and in square brackets.
- **Importing:** Select one or several Instruments, and finish importing by clicking on the "Import" button. Now, the Instrument will be displayed white and without the square brackets. The padlock symbol (see page 65) of the MIDI channel will be closed.

You can now repeat the process for the other MIDI channels until your arrangement is fully equipped with appropriate Instruments. All Instruments that have been assigned to a MIDI channel are colored orange when displayed in the Pool.

When importing Instruments for a song, it is generally a better idea to not to pin yourself down too early, but rather to import all of the Instruments to the Pool that you would seriously consider using for your sequencer tracks. While you are working with the Instruments of the Pool, it is easy to quickly test and switch them. Re-open the desired MIDI channel slot (double-click on the lock symbol) and step through the Instruments of the Pool using the cursor keys. Once you’ve made your decision, lock the MIDI channel slot again.

### 4.3.4 Importing from the Bank Manager

Similar to the Import Window, Instruments which have been entered in the Bank Manager can be imported directly to a MIDI channel or to the Pool.



In the middle column, select the desired Instrument and import it with either the “Import” button or by double-click. In order to use the preview function which you are familiar with from the Import Window, activate the option “Preview Instrument” per context menu (right mouse click). To automatically load the Instrument to a MIDI channel the channel slot has to be unlocked (opened padlock symbol). Then you can step through the Instruments using the cursor keys, and compare and contrast them before deciding which ones to import. When you’ve finished testing an Instrument and like it, don’t forget to import it permanently to the Pool using the “Import” button.

The same functions are also available in the Category Browser (right column). Open the folder of a category and import the desired Instrument by double-click.

## 4.4 Assigning Instruments to MIDI Channels

### 4.4.1 The MIDI channel's padlock symbol

The previous version VSampler 2 offered an option similar to that of many hardware synthesizers – globally switching (see the appendix of the Reference Manual) between:

- **Preset mode:**  
automatically plays the current Instrument (ignores MIDI channels)
- **Multi mode:**  
every MIDI channel plays it's previously assigned Instrument

VSampler 3 combines the advantages of both modes: each MIDI channel can be switched **separately**. This way, certain MIDI channels can automatically playback the Instrument currently selected in the Pool (like the “Preset mode”) while all other channels can keep their assigned Instrument (like in the “Multi mode”).

In front of each of the 16 MIDI channels is a padlock symbol which is either open  or closed . Double-clicking the padlock symbol will lock or unlock the corresponding MIDI channel:



Channels 1 to 9 locked (hard-wired),

Channels 10 to16 open (play the currently selected Instrument of the Pool)



#### **locked**

The Instrument is hard-wired to this MIDI channel (corresponds to the classic Multi mode). This can take place in the following ways:

- by double-clicking an open padlock symbol
- per drag & drop of an Instrument from Pool, Import Window or Windows Explorer
- by the “Import” button of the Import Window

- with a Program Change<sup>1</sup> message, for example when another Instrument is chosen in the track properties of the sequencer



### **open**

No Instrument has been assigned to this MIDI channel yet, it always plays whatever Instrument is currently selected in the Pool (corresponds to the classic Preset mode). When you are stepping through the Instruments in your Pool, Import Window or Bank Manager using the cursor keys or the mouse, all open MIDI channels will follow your selection. The selected Instrument is automatically loaded, so that you can hear it right away during playback of a song, and can play it on a keyboard. As soon as you've found the right Instrument, lock the MIDI channel by double-clicking the padlock symbol.

The default setting for all 16 channels is “open,” i.e. VSampler plays the currently selected Instrument on all 16 channels.

#### **4.4.2 Decision: Assign Instruments in Sequencer or in VSampler?**

You can assign Instruments either in the track properties of the sequencer or in VSampler's MIDI channel slots. You should decide for one way or the other. We recommend using VSampler's MIDI channel slots.



It is not recommended to mix the two methods! Particularly MIDI newcomers will run into the problem that starting/stopping the sequencer will cause the MIDI channels to “lose” their Instruments. For reason and solution see “4.4.4. Assigning MIDI channels in VSampler” on page 67.

#### **4.4.3 Assigning MIDI channels in the sequencer**

Select the Instrument in the track properties of the sequencer, just like you are used to doing with other plug-ins or MIDI devices. The corresponding setting is called “Program” in most sequencers (also prg or prog). Some sequencers show the real names of the VSampler Instruments, while others only show the classic MIDI program numbers (which correspond to the row numbers in the VSampler Pool).

---

<sup>1</sup> MIDI command to change Instruments

**Note**

The sequencer track is then set to a fixed Bank and Program number. For this reason, the program number plays an important role when switching Instruments, which is not the case with the variation “Assigning MIDI channels in VSampler” (see 4.4.4. on page 67). When you want to import a new Instrument to a sequencer track, or would like to use the “Preview Instrument” function (see page 52) of the Import Window, you must replace the Instrument at the slot corresponding to it’s previous program number. To do this, place the cursor on the corresponding program slot in the Pool **before importing**, so that it will be imported to that position, replacing the previous instrument.

**Important import settings**

The option "Instruments Pool slot in use?" (see page 53) of the Import Window must be set to “**Replace**”. Otherwise, the new Instrument will be imported to the next free slot of the Pool, whose program number then will not correspond to the one set in the sequencer’s track properties. The track would continue to play the old Instrument, and you would have to then select the new Instrument in the sequencer’s track properties.

**4.4.4 Assigning MIDI channels in VSampler**

This is the simpler and more flexible way, because you don’t have to bother with the Instrument’s program number. At the end of this chapter two important settings are explained, so please read the whole chapter. The following methods are available for assigning an Instrument to a MIDI channel:

**Variant 1: Drag & Drop**

Drag a file from the Windows Explorer or an Instrument from VSampler’s Pool or Import Window onto a MIDI channel slot.

**Variant 2: on the MIDI channel slot itself**

Double-click the MIDI channel slot, and choose an Instrument from the list of available Pool-Instruments. To quickly compare Instruments: use the + (plus) and – (minus) keys of the numerical keyboard to switch one Instrument forwards or backwards.

**Variant 3: in the Pool / Import Window / Bank Manager**

Open the padlock symbol of the MIDI channel by a double-click, and use the cursor keys to step through the Instruments of Pool, Import Window or Bank Manager. Each currently selected Instrument is automatically loaded to all

opened MIDI channels and can be heard in the song. Once you've decided on an Instrument, lock the MIDI channel by a double-click. The automatic preview of Instruments even before the Import is described in chapters "4.3.3. Importing using the Import Window" on page 60 and "4.3.4. Importing from the Bank Manager" on page 64.

Please pay attention to the following two settings:

### **Important import settings**

The option "Instruments Pool slot in use?" (see page 53) of the Import Window must be set to "**next free**" (default setting). VSampler then automatically searches for the next free slot in the Pool, you don't have to bother with it.

### **Important settings to avoid problems**

At the menu item "Options | MIDI | Preferences" on the "General" tab, you should switch off the reception of Bank and Program change messages unless you are using them in the song. This prevents the sequencer from inadvertently changing the Instruments in VSampler's MIDI channel slots.



The reason: most sequencers initialize their MIDI tracks when start/stop is pressed, by resetting them to the parameters of the track properties. This includes the Instrument numbers which the sequencer sends to the connected device as "program change" messages. When you change an Instrument inside a VSampler MIDI channel slot, the sequencer does not notice this change. That means, the track properties remain unchanged and might point to an empty Instruments slot of the VSampler Pool.

There are three possible ways to handle that, we recommend the first one:

- **allow VSampler to ignore the sequencer's Bank and Program change messages as suggested above**
- or: assign the desired Instrument in the sequencer's track properties
- or: instead of choosing a program number, choose the option "off" which is available in most sequencers

#### **4.4.5 Troubleshooting: no sound when playing the keyboard?**

If you don't hear the expected Instrument during sequencer playback or when playing your MIDI keyboard, but can hear it when playing the on-screen key-

board: observe the blinking MIDI channel slots to see whether the desired Instruments are assigned to the correct MIDI channels.

If the blinking MIDI channel slot is empty, then you have either forgotten to assign an Instrument to it, or your sequencer has inadvertently changed the Instrument, see previous chapter.

If no MIDI channel is blinking, check in the menu item “Options | MIDI | Devices”, to see whether the corresponding MIDI device is activated (see also "5.3. Setting Up MIDI Devices" on page 83).

## 4.5 Using Separate Outputs

VSampler can output sounds to up to 32 different individual outputs (Standalone- and OEM-version: 16), see “6.2.3 The 16 MIDI channels” on page 102. In the Standalone version, these can be the individual outputs of one multi-channel soundcard, or of different soundcards. When using the VSTi/DXi/ReWire version, the individual outputs show up as channel strips or audio tracks in your sequencer’s mixer as soon as VSampler is added to the project or connected per ReWire. Default setting is 4 stereo channels:

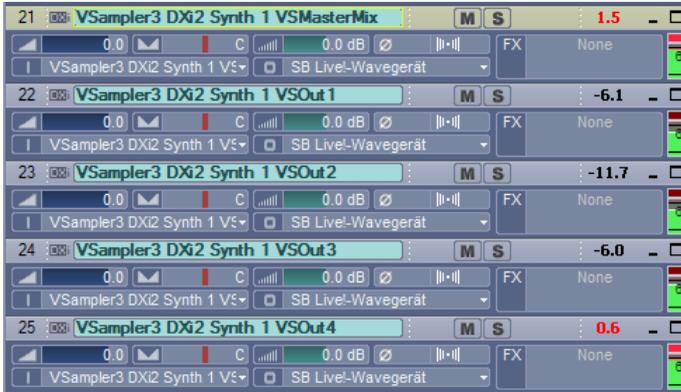


VSampler outputs in the Cubase SX mixer



...and in the Sonar mixer

**Tip for Cakewalk Sonar users:** In order for the VSampler individual outputs to show up in the mixer, and for Sonar to create the corresponding audio tracks, the checkbox “All Synth Outputs (Audio)” must be activated in the Insert Options dialog (see 2.4.3. on page 32). You can also later add the audio track manually and just set “VSampler 3 DXi Synth” as input device (left column in the illustration):



Sonar defines the individual outputs of VSampler as separate audio tracks

The following sections will explain the use of the individual outputs, which are available automatically. Information on how to set up and change the amount of individual outputs can be found at 5.2. on page 80.

#### 4.5.1 Display of the assigned output devices

The display of the 16 MIDI channel slots can be switched from Instrument names (position “Instrument”) to Output device names (position “Output”).



Slide-switch for Instrument name / Output device

Except for the names, the display and setup of the individual Instrument outputs is identical for Standalone/VSTi/DXi/ReWire:



View of the output devices with audio level (here: Standalone outputs to soundcard devices)

## Operation



View of the output devices with audio level (here: VSTi plug-in outputs to VST mixer channels)

In the case of the DXi plug-in, the individual outputs are called DXi #1, DXi #2 etc., in the case of ReWire they are called ReWire #1, ReWire #2 etc.

### 4.5.2 Assigning Instruments to output devices

In order to change the output device of an Instrument you can either open the context menu (right mouse button) of the desired MIDI channel and click "Select output device". Or you can double-click on the desired MIDI channel in the previously described output device display. Following this, a list of the available output devices appears.

You can either choose a specific device as output device (hard-wired), or you can select the current standard device. To indicate the status of the output device assignment VSampler uses a padlock symbol, similar to the Instrument assignment (see 4.4.1. on page 65):



**locked**

The Instrument of this MIDI channel is hard-wired to a specific output device. By double-clicking the padlock symbol you can cancel the hard-wiring so that the current standard output device is used instead.



**open**

The Instrument of this MIDI channel is not hard-wired to a specific output device. It is routed to the standard device in accordance with the device settings (see "Choosing the Output Device" on page 78).

### 4.5.3 Assigning Samples to individual outputs (DXi, VSTi, ReWire)



When used per VSTi/DXi/ReWire, VSampler offers up to 32 flexible individual outputs, see "5.2. Setting Up Individual Outputs" on page 80. Not only can they be assigned to each Instrument as is the case with the Standalone version, but since VSampler 3.1 individual outputs also can be assigned to Samples **within** an Instrument. This function is particularly useful when applied to drum kits, for example to output the bassdrum and the snare to different mixer channels of the sequencer.

The assigning of Samples (Zones) to individual outputs takes place in the Editor View (switch views per menu "View") on the Zones page. To do this, select all of the Zones that should be played through an individual output, and set the desired output in the "Output" field:



Different individual outputs for Samples within an Instrument

## 4.6 Recommended Working Methods and Organization

After you have spent some time getting to know VSampler's features, you should make some decisions concerning your future way of working with VSampler. At a number of key positions, VSampler offers several ways of accomplishing a task, whereas in other software samplers just one of these variations is possible. This variety can be especially confusing to a newcomer, but for someone switching from another software sampler it is welcome, because it enables them to adapt VSampler to their accustomed way of working. For this reason we would like to present our opinion on the most effective way of working with VSampler in conjunction with a VSTi/DXi compatible sequencer.

### 4.6.1 General tips

When working on a song, use the Small View with the Instruments Pool or Import Window displayed. This view is optimized for the typical course of events that take place when assembling a song-specific Soundlibrary or filling the MIDI channels per drag & drop or double-click.

If a project pushes your PC to the limits of its processing power, please read "5.4. Optimizing Performance" on page 86 for possible solutions.

### 4.6.2 Settings

- Leave the global Soundlibrary option at the default setting of "linked Samples" (see 5.5. on page 93).
- Leave the DRC options at the default setting "activated" (see 6.5. on page 112).
- Activate the option "Save Bank with host project" (see 5.6. on page 97).
- Assign the Instruments to MIDI channels directly in VSampler, instead of in the track properties of the sequencer. When doing this, choose the appropriate settings, see page 68.
- Adapt VSampler's GUI to your way of working, see "3.3. Less is more" on page 41.
- Use drag & drop, a more comfortable basis than the Windows Explorer are file managers such as Total Commander, see [www.ghisler.com](http://www.ghisler.com)
- Use the numerous context menus. A right mouse click will show you on the spot which further actions or settings are available.

#### 4.6.3 Basis for working efficiently

- Build a set of .VS3 Soundlibraries sorted by subject. Fill these by importing Instruments from any of the supported import filetypes you own, **before working on the song**. Whenever you get new Instruments, you should check them in an extra session by using VSampler’s Import Window (see page 60). Import the ones you like into the respective subject-sorted .VS3 Soundlibraries. This way when you work on a song later, you can compare and apply the new Instruments right away, without having to bother with the conversion of non-native formats and the location of the Samples.
- **Before** importing Instruments with linked, non-native formats (e.g. Kontakt, HALion), move them to the desired directory together with their Samples. This both protects them from inadvertent deletion and also prevents you from having to search for the linked Samples (WAV files) later.

Whether you sort your sounds in separate .VS3 files (guitars.vs3, drums.vs3...) or manage all of your sounds in one single .VS3 file with corresponding column headings (128 Instruments in 128 columns are possible) is up to you. However, the more Instruments you combine into a Soundlibrary, the quicker it is to listen to and compare Instruments in the Import Window, without having to open many files.

- **Combine your favorite Instruments into a startup .VS3 Soundlibrary and use it to begin work on new songs.**

As an alternative to sorting your Soundlibraries by subject, you can also use VSampler’s Bank Manager (“Bank Mgr” button) to sort your Instruments incl. Akai/E-MU CDs in categories. All of the Instruments that have been entered in the Bank Manager can be previewed or loaded to an (opened) MIDI channel by double-click. We recommend this however only as an additional possibility, because the comfort of the Bank Manager can lead you to neglect the organization of the files themselves on your hard disk.

#### 4.6.4 Assembling the song-specific Soundlibrary

If you have followed the previous recommendations, you can now easily assemble individual song Soundlibraries based on your subject-sorted Soundlibraries. The settings are saved in the project file of your sequencer. Due to the previous conversion into the native VSampler format all instruments are immediately playable in the Import Window. You can use the same Instruments in multiple Soundlibraries without using disk space for their Samples repeatedly.

- Start your song with the Soundlibrary of your favorite instruments.
- When required, import further instruments from your subject-sorted .VS3 Soundlibraries, which could match with the song:
  - Open the padlock symbol of the desired MIDI channel slot.
  - Switch to the Import Window and choose one of your subject-sorted Soundlibraries for import. Use the Preview Instrument function to decide which Instruments to import. At this point, you should not pin yourself down too much, but actually collect several candidates for each of your sequencer tracks in the Pool. They don't cost additional memory or storage space.

Switch to the next MIDI channel slot and repeat the process for the other VSampler tracks resp. MIDI channels of the song, until your arrangement is fully equipped with the appropriate Instruments.

While you are working with the available Instruments of the Pool, you can quickly compare and exchange different Instruments and variations. Just open the padlock symbol of the desired MIDI channel slot, and step through the Instruments of the Pool using the cursor keys. Once you've decided on an Instrument lock the padlock symbol by a double-click.

After you have finished your song, you can archive the Soundlibrary of the song including all associated WAV files to be on the safe side. For more details please see "6.7. Archiving and Internet Exchange of Soundlibraries" on page 115.

## 5 Important General Settings

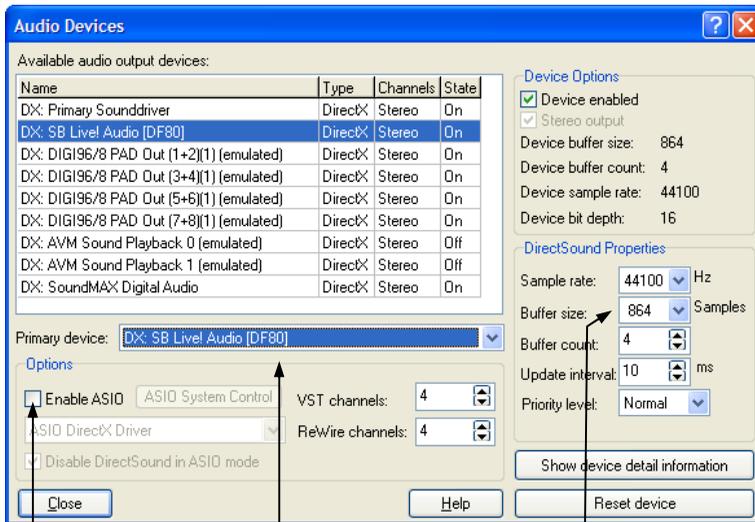
Due to the unlimited variations of possible sounds, VSampler is used by musicians for very different projects on very different computer systems. The following general settings enable you to adapt VSampler to your project and system, to achieve the best possible quality and performance.

### 5.1 Setting Up Audio Devices

#### 5.1.1 Standalone version



VSampler can run on any standard soundcard, either per DirectSound or ASIO. In the menu item “Options | Audio | Devices” you can change your soundcard settings:



Switching between ASIO / DirectSound

Setting the standard Output Device

Buffer size

By default, VSampler starts up with DirectSound devices enabled. If your soundcard supports ASIO, you should switch to ASIO. To do this, select “Enable ASIO”. The difference between DirectSound and ASIO will be explained at the end of this section.

### Choosing the Output Device

- Assign a standard Output Device. Do not use a device with an **emulated** DirectSound driver, as this will not allow you to achieve error-free audio playback.



Make sure that the audio output from VSampler and from the sequencer don't block each other.

When both programs use the same soundcard, the soundcard must have either individual outputs or have “multi-client” capability. It is not recommended to use ASIO and DirectSound simultaneously.

- Deactivate all unneeded devices that you do not want to use as individual outputs. To do this, click on the last column of these devices so that their state switches to “Off”.
- Close the dialog window.

Now, try playing your keyboard to test the settings. If necessary, reopen the previously mentioned menu “Options | Audio | Devices” again and adjust the buffer size (see the screenshot on the previous page), to achieve a clean and delay-free audio playback.

### Adjusting the Buffer size

The buffer size determines the size of data packages sent to the soundcard. The smaller the buffer size, the shorter the delay (latency) between the striking of a key and the audible output of sound. A small buffer size does however increase the demands on the soundcard driver and the entire system. For DirectSound devices, the buffer size can be set in the “Buffer size” field. For ASIO devices, the buffer size is set in the control panel of the soundcard itself, which you can open by clicking “ASIO System Control”.

To reduce the latency, **decrease the Buffer size**. After doing so, make a test to make sure that the audio playback is still error-free. The minimum possible value depends on the quality of your soundcard driver.

If the Buffer size is **too** small, then you will hear clicks, or the playback will stutter. In this case, **increase the Buffer size**. Inform yourself on the website of the soundcard manufacturer, whether a newer driver is available for your soundcard, with which a lower latency could be reached.

### ASIO or DirectSound?

Both standards have the goal of producing lowest possible sound-output delay following a user action. **ASIO** (Audio Streaming Input Output) is a driver specification developed by Steinberg to enable the delay-free playing of software synthesizers. **DirectSound** is part of Microsoft’s DirectX, a driver specification designed for the delay-free playback of audio in computer games.

Typically, ASIO offers a lower latency and greater reliability, because in comparison with DirectSound, it handles sound output with higher priority than other processes (e.g. graphic output). In some cases it is possible to further improve the ASIO performance by switching the system performance optimization from “Programs” to “Background services” in the Windows control panel. This option is accessed under “Performance and Maintenance | System | Advanced”.

For further information, see section “6.8. Optimizing the PC for Audio Performance” on page 116.

#### 5.1.2 VSTi, DXi, ReWire



The OEM version “VSampler 3.0 DXi” includes the DXi-plug-in, but not VSTi plug-in and ReWire. If you like, you can purchase them as an upgrade, see “1.5. OEM Version vs. Independent Version” on page 20.

In plug-in and ReWire mode, VSampler is not connected directly to the soundcard, but rather to the mixer of your sequencer. That’s why you don’t have to change any of your settings. The sequencer sends VSampler’s audio data to the soundcard, together with the audio data from the other tracks:

VSampler → Sequencer → Soundcard

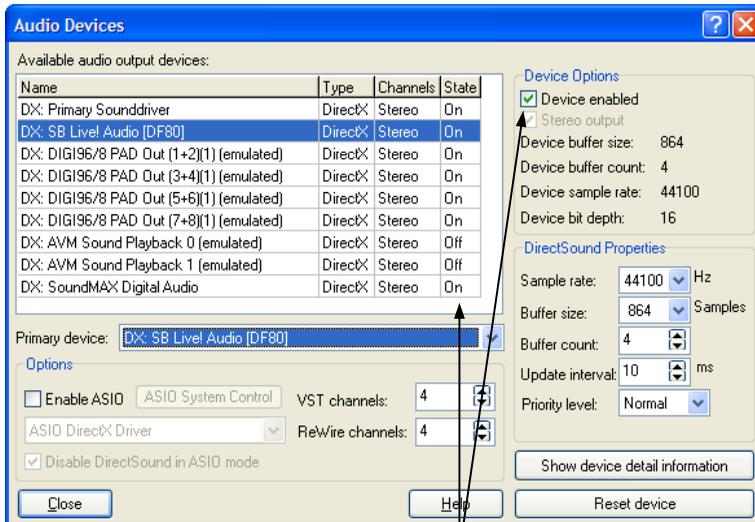
VSampler automatically uses the output devices assigned in the sequencer. For information regarding the appropriate audio settings, see the documentation of your sequencer.

## 5.2 Setting Up Individual Outputs

### 5.2.1 Standalone version



Each of the 16 Instruments assigned to a MIDI channel, can be routed to a different soundcard device. A maximum of 16 individual stereo outputs is available, depending on the number of soundcard devices you have activated. These can be the individual outputs of a multi-channel soundcard, or multiple soundcards. Each device can be activated or deactivated under the menu item: “Options | Audio | Devices.”



Activation / Deactivation of Output Devices

All devices which are set to “On” in the “State” column will be available as individual outputs. In order to change the state, click on the state column of the respective device or on the “Device enabled” checkbox.

### 5.2.2 VSTi, DXi, ReWire

By using VSTi/DXi/ReWire, up to 32 flexible individual outputs (OEM version: up to 16) are available and can be assigned to Instruments or to specific Samples within an Instrument.

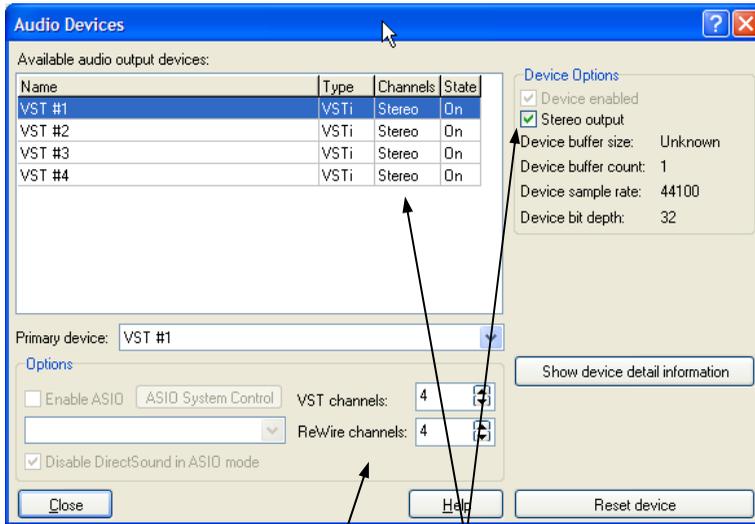
3.1

Individual outputs for Samples **within** an Instrument are not available in the “VSampler 3.0 DXi” OEM version, see “1.5. OEM Version vs. Independent Version” on page 20.



They can be switched between mono and stereo: 32 mono or 16 stereo or any mixed combination. By default, 4 stereo outputs are available as mixer channels / audio tracks in the sequencer.

The number and type (mono/stereo) of the output channels can be adjusted under the menu item “Options | Audio | Devices”. Except for the names, there is no difference between the displays of the VSTi/DXi/ReWire channels:



Adjusting the number of Outputs

Switching between mono/stereo

In order to transform a stereo pair into two independent mono channels, click on the “Channels” column or on the “Stereo output” checkbox. If your sequencer does not support mono audio channels, then switching will have no effect, and the channel pair will continue to appear as stereo channels.

Please also read the tips concerning the adjustment of the number of channels, in the following section.

### 5.2.3 Plug-in: changing the number of outputs in a project

The fact that an active plug-in can change the number of its audio outputs, can be more than some sequencers (especially older versions) are able to handle. Because of this, when loading a project, VSampler checks whether the number of channels saved with the project is equal to the current number of channels. If not, VSampler will display a warning and show the old and new number of channels. If your sequencer should not be able to open the project, the following workaround will help:

- close the “problematic” project
- create a new project, and use it to set VSampler back to the previously shown old value of number of channels, then close the project
- load the “problematic” project
- save the VSampler content as a .VS3 file
- remove VSampler from the project
- save the project and close the sequencer
- restart the sequencer and load the project
- re-insert VSampler, and load the previously saved .VS3 file
- re-assign the tracks and outputs
- save the project and close it

## 5.3 Setting Up MIDI Devices

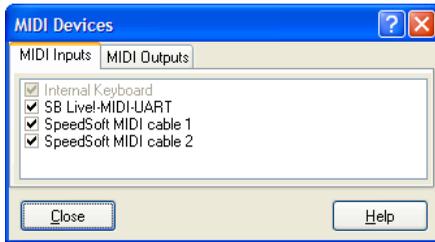
### 5.3.1 Connecting to a MIDI keyboard

#### Standalone version



Caution: These instructions **only** apply to the Standalone version! Information concerning VSTi/DXi/ReWire can be found in the next chapter.

Following the installation, all MIDI Input Devices are activated by default, so that VSampler can be played right away with any connected MIDI device. In order to see a list of your MIDI devices, open the menu item “Options | MIDI | Devices”. You see the tab “MIDI Inputs”:



Select the MIDI Input Device of the soundcard to which your MIDI keyboard is connected. In the example screenshot above that would be the “SB Live!-MIDI-UART”, because the MIDI keyboard is connected to the “SB Live!” soundcard. For more information regarding the two “SpeedSoft MIDI cable” devices, see the next chapter.



If you operate VSampler and a sequencer simultaneously, make sure that the activated MIDI input devices of both programs don’t block each other!

VSampler and the sequencer should be assigned to different MIDI input devices. Most soundcards don’t allow the use of one MIDI device by several programs.

### VSTi, DXi, ReWire



The OEM version “VSampler 3.0 DXi” includes the DXi-plug-in, but not VSTi plug-in and ReWire. If you like, you can purchase them as an upgrade, see “1.5. OEM Version vs. Independent Version” on page 20.

As a VSTi/DXi plug-in or when receiving MIDI data per ReWire, VSampler is not connected to the soundcard, but rather receives its MIDI data from the MIDI tracks of the sequencer:

Keyboard → Sequencer MIDI track → VSampler

For this reason, set the desired MIDI input device as usual in the track properties of the sequencer. For more information, see the documentation of your sequencer.

#### 5.3.2 Setting up the virtual MIDI cable



It is only necessary to install the virtual MIDI cable if your sequencer supports neither VSTi/DXi plug-ins, nor ReWire. It connects VSampler to classic MIDI sequencers, such as [Cakewalk Pro Audio](#), [Band-In-A-Box](#), [Power Tracks Pro](#), [Sibelius](#) or [Finale](#).

The virtual MIDI cable has already been installed by VSampler’s setup program, if you did activate the option „Speedsoft MIDI Cable“. If you are not sure, please read further. To check if the virtual MIDI cable is present, select the menu item “Options | MIDI | Devices”:



If the two “SpeedSoft MIDI cable” entries show up and are activated, then you can now play VSampler through your sequencer. All further steps are explained in “2.3. Standalone-Version” on page 27.

If the “SpeedSoft MIDI cables” do not appear, run the VSampler setup program again and in “Step 5” of the installation (see page 14) activate the “Speedsoft MIDI-Cable” checkbox.

VSampler installs two virtual MIDI cables. The second cable is not currently needed, it is for connecting future software instruments from Speedsoft.

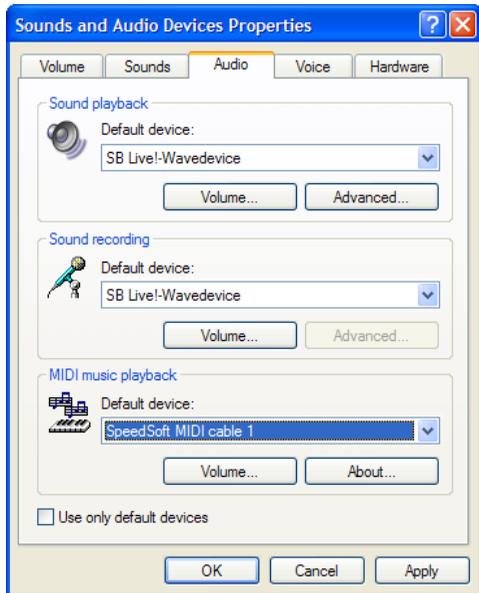


The SpeedSoft MIDI cable receives data from any MIDI sequencer. However, it only sends data when the other end is connected to a SpeedSoft Instrument.

This avoids operational errors and MIDI feedback loops.

After the virtual MIDI cable has been successfully installed, it appears in Windows as a new MIDI output device “SpeedSoft MIDI Cable 1”. It can now be used by any sequencer just like a hardware MIDI output, also for example as the standard output device of the Windows Media Player, as shown in the screenshot.

All further Steps are explained in “2.3. Standalone-Version” on page 27.

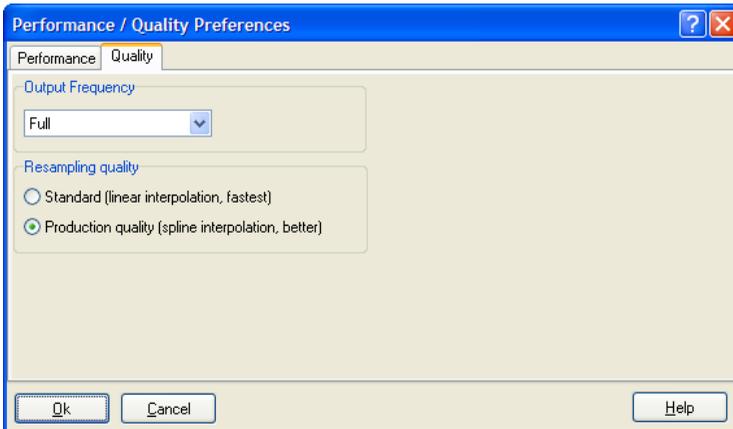


## 5.4 Optimizing Performance

### 5.4.1 Setting the Resampling quality

The basic function of a sampler is to convert a recorded Sample to other pitches, and to play it back at the sample rate demanded by the connected output device (sequencer / soundcard). This process is called “resampling”. It takes place independently and in real-time for every audible Voice.

VSampler offers two parameters for controlling the computing performance during resampling. The performance can be optimized for either tempo or quality. Open the menu item “Options | Audio | Performance / Quality” and choose the tab “Quality”:



Choose one of the three following setting variations:

- Tempo: Output frequency “Half” + Resampling quality “Standard”
- Standard: Output frequency “Full” + Resampling quality “Standard”
- Quality: Output frequency “Full” + Resampling quality “Production”

Compare the results and decide for yourself. As a rule, you should only change the Resampling quality and leave the Output frequency at “Full”.

### Output frequency

You should only change the standard setting “Full” if you need to spare the last droplet of processor performance and can’t find any other way. This setting determines whether VSampler internally computes with the full, half, or quarter frequency of the connected output device (sequencer / soundcard). The audio quality suffers noticeably especially at the setting “quarter”: LoFi at it’s best.

### Resample quality

For many Instruments, the difference between “Standard” and “Production” is hardly audible, so in most situations, “Standard” should be sufficient. “Standard” is almost twice as fast as “Production”, and the maximum polyphony is therefore almost doubled as well. When making a mixdown<sup>1</sup> you should switch to “Production” in order to achieve the best quality.

### Taking advantage of the special case “no resampling”

If you use modern sampling CDs with multi-sampled Instruments, often separate Samples are made for almost every key, i.e. they play at their original pitch, and VSampler doesn’t have to do any resampling at all. This is the case for example with almost all sampled drum Instruments. In order to make use of this performance advantage, you should set your sequencer to a playback frequency that corresponds to the sampling frequency of your Samples.

## 5.4.2 Limiting polyphony - background

The term “polyphony” refers to the number of Voices that an Instrument can play back simultaneously (see “6.6 Polyphony” on page 114). High polyphony requires a large amount of processing power, however, achieving the maximum polyphony is not always necessary.

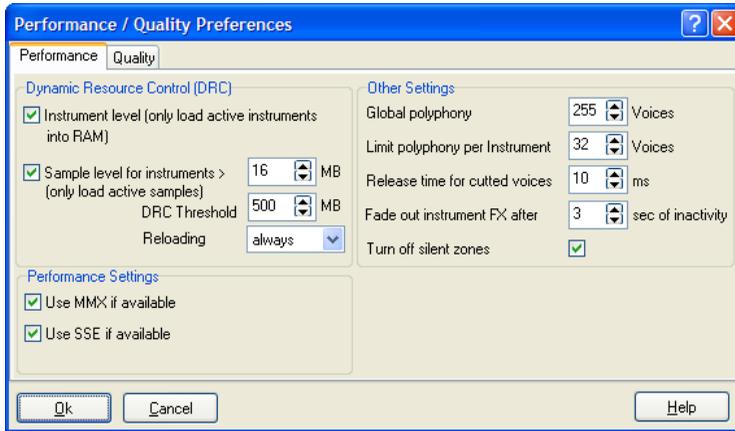


Limiting the polyphony is the simplest and most effective way of reducing the demands on processor power without reducing the audio quality.

VSampler allows you to limit polyphony both globally (see screenshot) and per Instrument. Open the menu item “Options | Audio | Performance / Quality” and choose the tab “Performance”:

---

<sup>1</sup> Mixdown: all tracks of a song are mixed (e.g.) into a WAV file, e.g. in order to burn the file on a CD



Both general polyphony settings are found at the top right:

- **global:** What is the maximum number of Voices allowed to play altogether?
- **per Instrument:** What is the maximum number of Voices that an individual Instrument is allowed to play?

These settings go into effect immediately and are generally valid. The Instrument settings themselves are not changed, but rather “overruled”, the effective polyphony limit is always the smallest one of the settings.

### **Exceeding polyphony limits**

When more Voices are played than are allowed by the polyphony limitations, then VSampler automatically stops the oldest Voice, giving preference to Voices already in their decay phase. This behavior allows Instruments to be played naturally even with low polyphony. If for example you are holding a bass note with your left hand and playing a fast melody with your right, then VSampler will not cut the bass note if the max. polyphony is exceeded, but rather one of the decaying notes of the melody.

### **Polyphony killer**

After releasing a key, a Voice does not immediately cease, but rather gradually fades out depending on the Instrument, as for example is the case with a plucked guitar string. For this reason, VSampler often must compute a far greater number of Voices than one might suspect. The polyphony of a classical piano piece for example can easily exceed 30 Voices, although a pianist can

only hit 10 keys at a time. Particularly the use of the sustain pedal can rapidly increase the polyphony.

In cases like these, limiting the polyphony is a good solution.

### 5.4.3 Limiting polyphony - implementation

The standard setting for global polyphony is 255, and for Instrument polyphony 32 (see also “6.6.2 Counting Voices” on page 114). When limiting the polyphony, you should rely on your ear and at the same time keep an eye on the number or active Voices as shown in the top right corner of the VSampler GUI.



After a while, you will be able to adapt the performance of VSampler to your project with a few mouse clicks, in order to free up processing power for other tracks.

#### General Limitation

- playback your song at the position with the greatest polyphony, and note the maximum number of Voices
- limit the global polyphony to approx. 3/4 of this value
- playback individual tracks solo, and note the maximum number of Voices of the most demanding track
- limit the Instrument polyphony to approx. 3/4 of this value

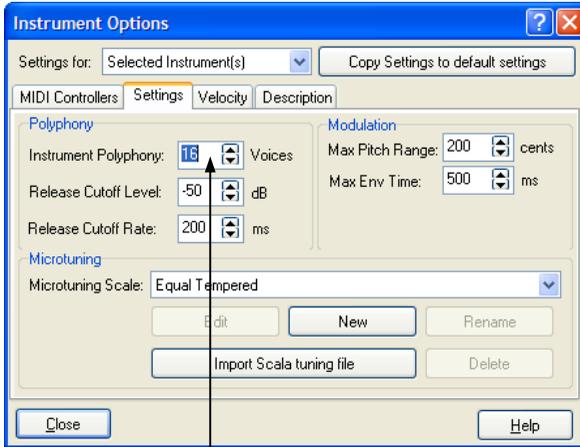
Play your song again, and adjust the polyphony values up or down as necessary. If you are uncertain, it is usually better to adjust the Instrument polyphony instead of the global polyphony.

#### Individual limitation per Instrument

In most cases, the method described above is sufficient. If you are working intensively with VSampler, it is better to set the individual polyphony for the Instrument itself before you save the Soundlibrary. The effective limitation used for playback is the smaller value of general limitation and individual instrument limitation. The polyphony can also be changed for several Instruments at once:

## Important General Settings

- mark all of the desired Instruments in the Instruments Pool (by holding Shift resp. Ctrl key)
- per context menu (right mouse button) click on the desired Instrument and select “Instrument Options”:



- set the desired value in the “Instrument Polyphony” field
- close the window and save the Soundlibrary

The two values below, “Release Cutoff Level” and “Release Cutoff Rate,” automatically prevent the waste of processing time: Voices which at the end of their decay phase drop below -50 dB are faded out within the designated time at the latest.

### 5.4.4 Optimizing DRC

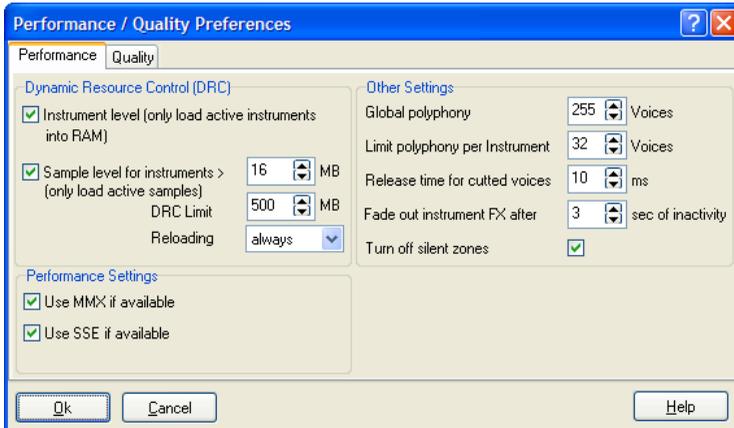
Dynamic Resource Control (DRC) enables VSampler to load and playback Soundlibraries and Instruments of any size, it is not limited to the size of your main memory (RAM).

**3.1**

~~OEM~~

Sample level DRC is not available in the VSampler 3.0 OEM version, see “1.5. OEM Version vs. Independent Version” on page 20.

For more information on DRC, see section 6.5. on page 112). Open the menu item “Options | Audio | Performance / Quality” and choose the tab “Performance”:



DRC operates at 2 levels which are by default both activated:

- DRC 1 at Instrument level (since VSampler 3.0)
- DRC 2 at Sample level (since VSampler 3.1)

An explanation of the two DRC levels and their advantages and disadvantages can be found in section 6.5. on page 112. Under certain circumstances, changing the standard DRC settings can improve performance:

### **DRC 1 at Instrument level**

When this option is activated, instead of all Instruments of the Soundlibrary, only the currently active Instruments are loaded into RAM. DRC 1 should only be shut off when you use "program change" messages in your song, and the switching of Instruments is not fast enough.

### **DRC 2 at Sample level**



When several highly polyphonic Instruments are used simultaneously, the increased effort of dynamic memory management places high demands on the processor and the hard disk. There are three parameters to adjust the DRC 2 performance:

## Important General Settings

---



### Sample level for Instruments larger than...

Here is where you can set the minimum Instrument size for DRC to be used. For very small Instruments, the dynamic management processing effort of DRC 2 doesn't make sense. If you have 512 or more RAM, then you can raise the default value from 8 to 16 MB.

### DRC Limit

Here is where you can set the maximum amount of RAM that VSampler is allowed to use for Sample data. The standard setting is 1/3 of your computer's RAM size. The more RAM that VSampler has available, the greater the max. polyphony (see 6.6 on page 114), because greater amounts of RAM reduce the demands on the processor and the hard drive. If you have 512 MB or more RAM, you can usually raise the default DRC limit.



Make sure that enough RAM is available for all other programs that are running simultaneously, including Windows itself. In Windows 2000/XP you can open the Task Manager with the key combination **Ctrl + Alt + Del** to show the available "Physical Memory" when VSampler is empty. As a rule, you should have at least 150 MB reserved for other programs.

### Reloading

Here is where you can set how VSampler reacts to size changes of the active Instruments. In practice, this plays a role when removing an active Instrument or changing the Instrument of a MIDI channel, e.g. when testing and comparing Instruments. In this case VSampler automatically optimizes the memory organization to match the new condition.

- **Advantage:** VSampler exploits the available main memory optimally, all instruments reach a high polyphony while straining processor and hard disk as little as possible.
- **Disadvantage:** Changing between differently sized instruments may take longer, since the reorganization of the main memory takes some time, depending on the size of the other active Instruments.

For this reason, there are two optimization options:

- **lazy:** default setting, only re-optimizes the memory organization after the size of the active Instrument has been changed by a certain amount, some main memory might be unused until the next change
- **always:** re-optimizes the memory organization after every size change of the active Instruments

You should leave the option at the default setting "lazy", not fully optimized main memory utilization doesn't have consequences, as a rule. At the latest, the next time the Soundlibrary is opened the optimization status will be back at 100%.

General tip: If you experience drop-outs at high polyphony, do **not** switch off DRC 2 yet, but rather:

- limit the Instrument polyphony, see “5.4.3. Limiting polyphony - implementation” on page 89
- raise the DRC limit as previously described

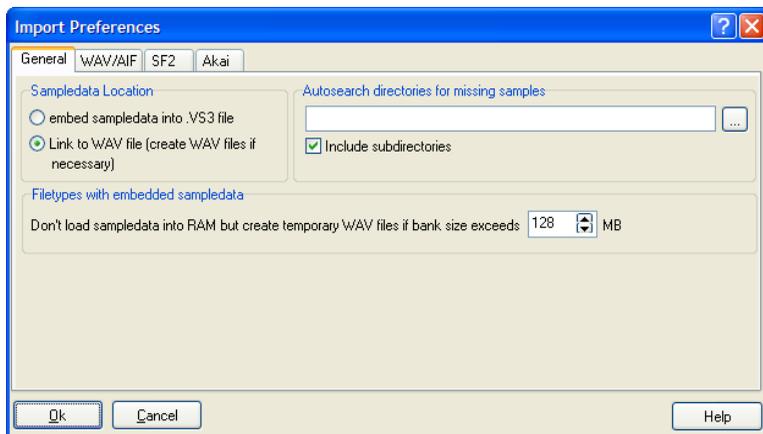
## 5.5 Decision: Linked or Embedded Samples?

### 5.5.1 Comparison

VSampler can save a Soundlibrary with either linked or embedded Samples. The standard setting is “linked”. Both variations have their advantages and disadvantages. You should make a permanent decision for either one or the other ways of working. The setting can be made in the menu “Options | Import” on the tab “General”:

## Important General Settings

---



The difference between the two variations:

**linked (default setting)**

Soundlibrary settings (.VS3 file) and Samples (.WAV files) are stored separately. The .VS3 file does not include the Samples themselves, but rather links to the location of the WAV files.

**embedded**

Soundlibrary settings and Samples are stored together in a (large) .VS3 file. The Samples are embedded.

You can import VSampler Instruments of both types, and combine them at the same time in your Soundlibraries, whether linked (e.g. HALion, Kontakt) or embedded (e.g. GIG, SF2). As soon as you save your Soundlibrary as a .VS3 file, VSampler treats all Samples as determined in your general setting. When set to “linked”, VSampler will create new WAV files, if they don’t exist from the original Instruments already.

The advantages and disadvantages of the standard setting “linked”:

**Advantage 1: faster saving**

Because it does not include the Samples, the .VS3 file is very small, and can be saved within seconds. The reason: during work on the song, usually the Samples itself do not change, but only the parameters of the Instrument. Pre-existing Samples (WAV files) are not saved each time, as is the case when using the "embedded" Soundlibrary type.

**Advantage 2: multiple instances of the same Sample**

The linked Samples (WAV files) can be used by any number of Instruments and Soundlibraries without repeatedly using storage space on the hard disk. This way it’s no waste of space for example to import .VS3 Soundlibraries which are sorted by subject, choose the Instruments for a particular song, and store that selection as a new .VS3 Soundlibrary for the song.

**Advantage 3: external editing of the Samples possible**

The linked Samples (WAV files) can be edited in an external sample editor at any time, or they can be used in other programs. As soon as you reload the Soundlibrary, the edited Samples will be used automatically. This is quite useful for example when creating your own Instruments, because you can immediately hear the raw version of the Instrument and test it. You don’t have to cut and loop the Samples before deciding whether or not you like the Instrument.

### **Disadvantage**

If your files are not well organized (see “4.6 Recommended Working Methods and Organization” on page 73), there is a real possibility of deleting linked WAV files from your hard disk by mistake. When importing Instruments from linked non-native formats (e.g. HALion, Kontakt) VSampler links directly to the existing WAV files of the original Instrument. If one of those original Samples is deleted, it will irrevocably be missing from any Soundlibrary which linked to it.

### **5.5.2 Recommendation**

Particularly if you are working with Soundlibraries in the gigabyte range, and want to save it after changing a single Instrument parameter; the speed at which such a Soundlibrary can be saved is an advantage you won’t want to do without. Also, linked Samples allow you to save disk space when organizing your Instruments in various Soundlibraries. For further information, see section “4.6 Recommended Working Methods and Organization” on page 74.

In order for linked VSampler Soundlibraries incl. all of it’s WAV files to be safely archived or shared with other users over the Internet, VSampler offers a special solution: see “6.7 Archiving and Internet Exchange of Soundlibraries” on page 115.

### **5.5.3 Automatic search for not-found Samples**

If when loading a Soundlibrary, VSampler doesn’t find the linked Samples at their original location, an automatic search will be started. In most cases, you won’t even notice it. The search can however last quite a long time, since VSampler checks all paths that have been used in the current session. In this case, re-save the Soundlibrary after loading. This will replace the older sample paths with the current ones, and the searching becomes unnecessary.

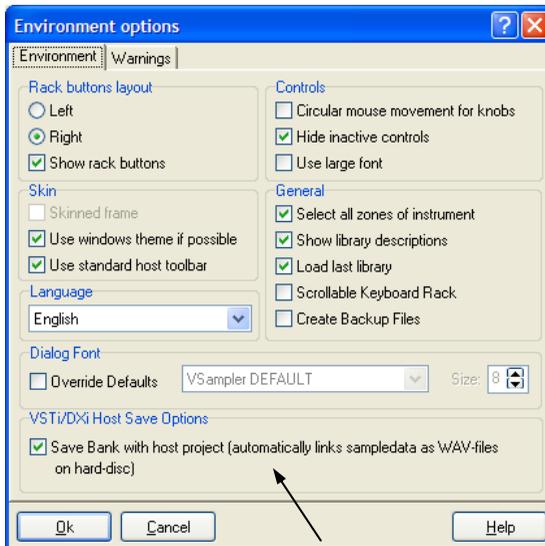
If the search is unsuccessful, VSampler will ask you to specify the location of the missing Samples. Click on the button “Automatic Search” and add the drive where you suspect the missing Samples to be. If the WAV files have actually been deleted, they are unfortunately no longer available to the Soundlibrary. VSampler automatically searches for the missing Samples in the following order:

- in the path of the .VS3 Soundlibrary file, including sub-folders
- in all paths from which Samples have previously been loaded

- in all paths that have been entered in the import settings as “Autosearch directories for missing Samples” (check menu “Options | Import”, on the “General” tab)

## 5.6 Decision: Save the Library in the host project?

In the menu “Options | Environment” on the “Environment” tab of the VSampler VSTi/DXi plug-in, you can determine how the current Soundlibrary should be saved:



Save the Soundlibrary in the host project, or as a separate .VS3 file?

In any case, VSampler saves the Soundlibrary automatically as soon as the project is saved. Likewise, the appropriate Soundlibrary is automatically loaded the next time the project is loaded. What you decide depends on how you organize your files. You should make a permanent decision for either one or the other ways of working. Our recommendation follows at the end of the section.

By default, the option “Save Bank with host project” is not activated.

### 5.6.1 Project-oriented: saving the Bank in the host project

If the option “Save Bank with host project” is activated, the Soundlibrary settings will be saved in the host project’s file, instead of in a separate .VS3 file. The Samples themselves (if they don’t already exist on the hard disk) will be created as WAV files; VSampler suggests the project directory as location.



The settings for “Sampledata Location” in the menu “Options | Import” apply only to saving .VS3 files. Generally, when saving in a host project, linked samples (WAV files) are used.

**Advantage:** The Soundlibrary settings are part of the project itself, and cannot be altered by mistake outside of the project. If you often save your project with different names while working on it (e.g. for back-up purposes), then this option saves you the trouble of also having to save the .VS3 file with different names.

**Disadvantage:** The Soundlibrary settings and Instruments are not available to other projects as long as they are only saved in the host project. This can be avoided by saving the Soundlibrary once as a .VS3 file or, while working on the song, by importing only the Instruments from existing .VS3 files that you have previously created by importing non-native format Instruments.

### 5.6.2 Soundlibrary-oriented: saving in a .VS3 file

If the option “Save Bank with host project” is **not** activated, VSampler saves the Soundlibrary as a separate .VS3 file and only it’s directory and location in the host project.

- **Advantage:** You can use the Soundlibrary in other projects as well, or in the Standalone version of VSampler.
- **Disadvantage:** Since only the name of the Soundlibrary is saved with the project, the Soundlibrary settings themselves are **not** an exclusive part of the project. Each parameter change will take effect in all projects that use these .VS3 files.

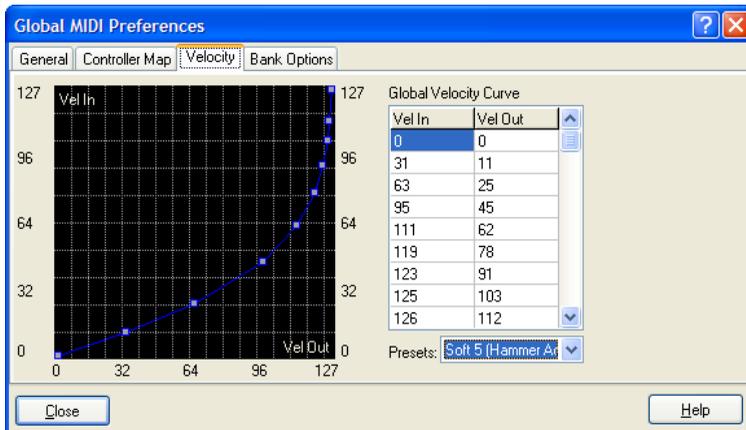
### 5.6.3 Recommendation

We recommend that you use the “Save Bank with host project” option. While working on the song, you should only import Instruments from .VS3 files that you have previously created by importing non-native format Instruments. For

further information, see section “4.6 Recommended Working Methods and Organization” on page 74.

## 5.7 Adjusting the keyboard velocity

In order to play VSampler expressively on a MIDI keyboard, you need optimal control of the entire velocity range. Since not all keyboards possess an ideal or at least an adjustable velocity, VSampler lets you choose a velocity curve that best fits to the velocity of your keyboard. You can find this option in the menu “Options | MIDI | Preferences” on the “Velocity” tab:



VSampler offer numerous curve presets. If you have a keyboard with hammer mechanics, then you will probably prefer one of the soft variations between soft 3 and soft 6, because with the standard setting “linear” the higher velocity values will set in too early, and a finer dosage in the lower velocity range won’t be possible.



If the velocity sensitivity is not satisfactory, you should attack the problem at the source, i.e. select another velocity curve at your keyboard, not in VSampler.

This way the sequencer already receives the corrected MIDI notes. The recorded velocity values are then compatible with every Instrument, not just with VSampler and it’s currently selected velocity curve, where a change would affect the playback of all of your previous songs.

## 6 Basics

### 6.1 What is a Sampler?

A (hardware) sampler is a special computer which transforms any digitally recorded sound into a musical instrument. The sampler doesn't care whether it's a plucked guitar string or a squeaky door hinge. It can playback the sound which it receives from a connected keyboard or sequencer software (see "6.2.2 The sequencer" on page 101) at any pitch with any melody.

The sampler is the only instrument which can mimic the sound of any instrument and enable a musician to play it, whether it's a natural instrument (piano, string, drum, etc.) or a synthesizer sound. Depending on the connected input device (drum pad, keyboard, breath controller, etc.) the sampler Instrument not only sounds like the original, but can also be played in a similar manner.

In many cases, a sampler can save you from buying expensive instruments, or the trouble of transporting heavy ones (e.g. a Concert Grand Piano). Any sampled instrument, no matter how exotic, can be played on a keyboard and controlled from a sequencer. It can bring a church organ and choir into the smallest home studio. It can make a monophonic synthesizer polyphonic, and can MIDify analog synthesizers. It can place an entire orchestra in the hands of a single person.

Last but not least: a) all Instruments remember their settings for each song, and b) thanks to the means and effort put into the production of sampling CDs, all Instruments have perfect audio quality from the start.

The easy operation of a software sampler such as VSampler, and the improved quality of soundcards also enable users to create their own good-quality sampler Instruments. Whether you want to have the drum kit from the basement in your living room, or to immortalize the two usable sounds from a synth that's been gathering dust, or to have the complete "best of..." your synthesizer collection available per mouseclick in your laptop ...

## 6.2 MIDI and Sequencer

### 6.2.1 The classic MIDI cable

Since over 20 years, musicians have been connecting their electronic musical instruments with a MIDI<sup>1</sup> cable, in order to let one device control (an)other device(s). The MIDI cable does not transmit sound (audio), but rather commands, such as which sound is to be played at what time. The simplest use is the connection between a MIDI keyboard and a sound module (e.g. VSampler):

MIDI keyboard  $\leftrightarrow$  MIDI cable  $\leftrightarrow$  sound module

- musician strikes keys on the keyboard
- keyboard sends messages to the sound module to play the notes
- sound module receives note-messages and transforms them into sound

Typical MIDI-messages are e.g. start and end of a note (Note On / Note Off) or switching to another sound (Program Change). This way the musician can use a MIDI keyboard to play the sounds and switch between the sounds of a connected synthesizer. How the transmitted note-message actually sounds, depends entirely on the connected synthesizer (or VSampler Instrument), and not on the MIDI keyboard.

### 6.2.2 The sequencer

A sequencer such as Cubase or Sonar can record audio data as well as MIDI data coming from a keyboard. After being recorded, both can be played back together. This way, different Instruments can be recorded on various tracks one after another, which in the end can be mixed and mastered into a complete song. The sequencer differentiates between audio tracks and MIDI tracks:

#### **Audio tracks**

Similar to a tape recorder, the sequencer records the sound of a connected instrument onto an audio track, which can then be played back. The recording is

---

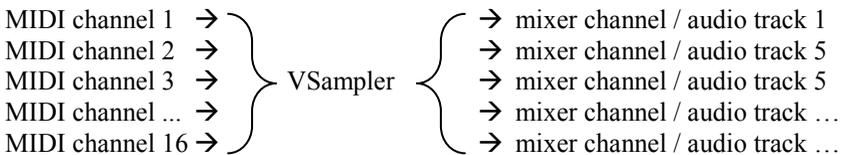
<sup>1</sup> Musical Instruments Digital Interface, the standard for connecting electronic musical instruments and controllers

“frozen”, meaning that the sound of the Instrument and the melody cannot be changed later<sup>1</sup>.

### **MIDI tracks**

Instead of the sound, the sequencer records MIDI messages which can e.g. be received from a keyboard. These messages can be altered in the sequencer in any way, e.g. in order to correct wrong notes or timing mistakes. In order for this data to become audible, the MIDI track sends the MIDI messages to a sound module such as VSampler. How the transmitted note-message actually sounds, depends entirely on the connected sound module. If another sound module is connected, or in the case of VSampler, if another Instrument is selected, then the previously recorded melody can be played back with a completely different sound.

Conclusion: VSampler receives it's MIDI messages from MIDI tracks, and plays back the produced sound through the soundcard (Standalone version) or in the mixer channels / audio tracks of the sequencer (VSTi, DXi, ReWire).



The MIDI channels are assigned in the sequencer's track properties, or in VSampler itself, the audio output is assigned in VSampler. For more information, see "4.4.4. Assigning MIDI channels in VSampler" on page 67 and "4.5. Using Separate Outputs" on page 70.

### **6.2.3 The 16 MIDI channels**

As illustrated above, a MIDI cable transmits data on 16 parallel channels which are numbered 1 – 16. These 16 MIDI channels can be connected to 16 different sequencer tracks, or (to demonstrate the principle) to 16 flesh and blood keyboards, playing back 16 different Instruments simultaneously. Because

---

<sup>1</sup> Innovative audio-to-MIDI converters such as [Melodyne](#) can analyze an audio recording and change the pitch and position of notes or convert them to MIDI data, however only with individually played monophonic instruments whereas the decay phase must not overlap with the next note

VSampler can receive and process data on all 16 channels, it is referred to as being 16 part multitimbral.

In order that each sequencer track (or each keyboarder) plays the right Instrument of the VSampler Soundlibrary, the MIDI channel used for sending data must be set in the track properties of the sequencer (or on the keyboard). With the exception of some global messages, MIDI messages always apply only to the MIDI channel with which they are sent. This way an entire multi-track arrangement can be played back by VSampler, e.g. channel 1 plays the strings, channel 2 the flute, channel 3 the bass, channel 10 the drums etc.



The 16 MIDI channels in the Small View

The sets of Instrument-assignments for the 16 MIDI channels can be stored in up to 64 combinations (see "6.4.5. Multi" on page 112), so that switching between different sound set-ups can be done quickly.

### 6.2.4 Sequencer tracks vs. MIDI channels

In the computer, the hardware MIDI cable is represented by a virtual equivalent, in the modern form as part of the VSTi/DXi/ReWire interface, in the classical form as a virtual MIDI cable.

Therefore, even modern sequencers are limited by the MIDI standard to a maximum of 16 simultaneously playable Instruments for each VSTi /DXi plug-in – a connection with more than 16 MIDI channels does not exist in the MIDI standard. You can however open several instances of the VSampler plug-in, each with it's own 16 additional MIDI channels.

Another burden of MIDI's past is that MIDI messages do not differentiate between sequencer tracks unless a unique MIDI channel has been assigned to each track. Most sequencers do this automatically whenever a new track is added.



The Instrument selection ("program change") is always sent per MIDI channel, not per sequencer track!

For each sequencer track both the Instrument and the MIDI channel must be set, otherwise all tracks would play the same VSampler Instrument

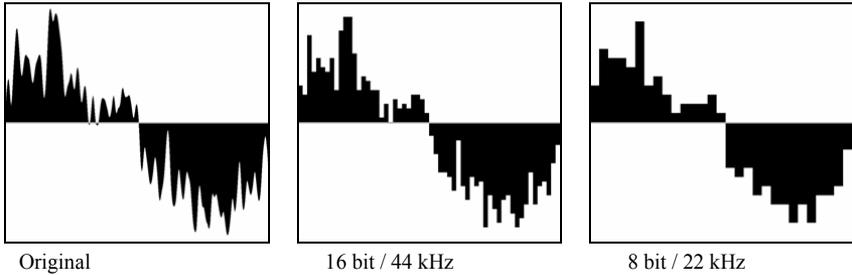
With the exception of some global messages, MIDI messages always apply only to the MIDI channel with which they are sent, this also applies to the message to switch Instruments ("program change"). This means, that if you assign the same MIDI channel to 3 separate sequencer tracks, and choose a new Instrument on one of these tracks, then it will be played back on all 3 of these tracks. This is the case even if different Instruments were originally assigned to each track.

For more information, see "4.4.4. Assigning MIDI channels in VSampler" on page 67.

### 6.3 Frequencies, Bits and Floating Points

The first digital sampler built in the early 80's was as expensive as a mid-sized car, and it had a recording quality and memory capacity inferior to that of a modern-day talking children's toy. A sampled instrument was easily recognizable, even for untrained listeners. The reason for this was the low digital resolution of the samples during conversion of natural (analog) sounds to sampled (digital) data, caused by the minimal memory capacity. Today, the situation is completely different. A modern sampler such as VSampler provides digital resolution of dynamics and frequency range that is far finer than the human ear can perceive. What is actually heard can naturally only be as good as allowed by the weakest link in the chain of soundcard (resp. D/A converter), amplifier and loudspeakers.

The more details that are digitally recorded, the larger the amount of data, but also the closer to the original sound. The following illustrations show the difference between the original analog sound, and two levels of digital resolution.



This illustrates, particularly the picture on the right, how the valuable details of the original sound are lost due to the relatively coarse raster. Besides the number of channels (mono, stereo, 5.1...) there are two factors which determine the maximum quality of a digital recording: sampling frequency (displayed horizontally) and bit depth (displayed vertically). More about this is explained in the following sections.

### 6.3.1 Sampling Frequency

The sampling frequency tells how often per second a digital sample of the original sound is taken. This is represented in the illustrations by the horizontal raster. The audio CD standard is 44.1 kHz, i.e. samples of the original sound are made 44100 times per second. In practice, the sampling frequency determines the max. possible upper limit of the recorded frequency range. Thus it has to be twice as high as the highest recorded frequency. This fact is also known as the “Nyquist sampling theorem”. This means for example, that the maximum frequencies that can be recorded on an audio CD are 22.05 kHz. Since most people can only perceive frequencies up to 20 kHz, a sampling frequency of 44.1 kHz is a good compromise between quality and memory capacity.

The idea behind using a higher sampling frequency (e.g. DVD audio up to 192 kHz) is to improve the resolution in the upper frequency range. The reason: a 20 kHz sinus oscillation for example can not be distinguished from a 20 kHz triangle oscillation after having been digitalized at a sampling frequency of 44 kHz. Only one single value is sampled alternately above and below zero, at a sampling frequency of 192 kHz, it would already be five values.

VSampler can load samples of any sampling frequency and play them back correctly. The playback frequency is limited only by the connected output devices (host sequencer resp. soundcard).

Conclusion: Your valuable sample material reaches the connected output device in any situation at it's optimal quality.

### 6.3.2 Bit depth

The bit depth indicates the number of volume levels of the original sound that are differentiated during digital recording. This is represented in the illustrations by the vertical raster. The audio CD standard is 16 bit, i.e. from the original sound,  $2^{16} = 65536$  volume levels can be differentiated. The greater the bit depth, the greater volume differences (contrast) between soft and loud sounds can be recorded and played back.

Here too, the 16 bit depth chosen for audio CDs is a good compromise between quality and memory capacity. However, when recording very dynamic instruments such as a piano, an interest in better depth resolution can arise rather quickly. Because of this, the converters of current soundcards support a resolution of up to 24 bit, which corresponds to 16.7 million volume levels.

In practice however, most soundcards with 24 bit capacity do not come near to achieving the theoretically possible values, because in addition to the converter chip a correspondingly good SNR (Signal to Noise Ratio<sup>1</sup>) requires costly analog equipment. They are however in any case preferable to typical 16 bit soundcards.

### 6.3.3 Zero clipping thanks to floating point processing

The entire network of VSampler and VSTi/DXi/ReWire-compatible sequencer operates internally with 32 bit floating point processing. This way, a dynamic range<sup>2</sup> can be reached that far exceeds that of 24 bit fixed point processing. The improved audio quality is however just a by-product. The main advantage is the clipping-free audio processing. **Within** the chain of instruments, effects and mixer no clipping occurs, no matter how high the level. Searching for the cause of clipping is no longer necessary. As soon as distortion becomes audible

---

<sup>1</sup> difference between the desired signal (sound) and unwanted noise in dB

<sup>2</sup> difference between the softest possible sound and the highest digital output level 0 dB in dB, similar to SNR in the "analog" world

through the output device, all that needs to be done is to adjust the level of the main mixer.

If the audio connection to the sequencer's mixer takes place by VSTi/DXi/ReWire, then short peaks will automatically be rounded off by the sequencer's soft limiter, before being routed to the soundcard. VSampler also has a soft limiter which can be activated to dampen the output level. This option is useful particularly when using the Standalone version, because in this case VSampler routes its signal directly to the soundcard.

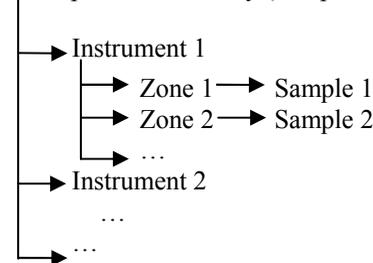
The clipping-free audio processing is made possible by a special quality of floating point operations. Depending on the size of the number, the point is internally shifted: The smaller the number, the more positions after the point are available, because they are not needed in front of the point. For audio processing, this quality is perfect because it corresponds to the "automatic gain control" of the human ear. Here is an illustration of this principle: When it's quiet, it's no problem to tell the buzz of a bee from the chirp of a bird. But if you're sitting next to a pneumatic drill, you will neither be able to hear swarms of bees nor birds. As soon as the noise level (=large number) drops, our ear adapts to the softer level (=small number), i.e. our ears can better perceive the nuances of soft sounds again (=more digits after the point).

## 6.4 The Structure of a VSampler Soundlibrary

In this section, the elements of a VSampler Soundlibrary are explained:

- **Soundlibrary:** consists of one or more Instruments
- **Instrument:** consists of one or more Zones
- **Zone:** contains one single Sample with a number of playback parameters
- **Sample:** the "raw" waveform (e.g. a WAV file)

VSampler Soundlibrary (complete contents)



The individual elements:

### 6.4.1 Soundlibrary

The term Soundlibrary refers to the entire content of VSampler. This includes all loaded Instruments and settings, incl. the MIDI channel assignments. The entire Soundlibrary can be saved as a .VS3 file, and be reloaded later.

For this reason, VSampler always contains exactly one Soundlibrary (see "4.2. Loading a Soundlibrary" on page 58). Of course you can add Instruments from other Soundlibrary files at any time (see "4.3. Importing Instruments" on page 59). The new Soundlibrary composition can be saved as a .VS3 file, e.g. to fit to your song.

### 6.4.2 Instrument

A Soundlibrary consists of max. 16384 Instruments, which can be viewed in the Instruments Pool (see page 48). Click the "Pool" button in the Small View, or select the "Instruments" page of the Editor View to go to the Instruments pool. The terminology may differ, instead of "Instrument" some manufacturers use the term "program", "patch", or "preset" - it all means the same thing. The view of the Instruments is presented GS<sup>1</sup> conform, it is divided into 128 rows (programs) and 128 columns (banks).

P	same sample used	The Making Of	Bank 2	Bank 3	Bank 4	Bank 5
1	auto	the raw sample				
2	beat - play chords :)	vol-env + doubled				
3	dirty talk	filter - static				
4	res	+ filter - env				
5	brass	+ some randomization				
6	frog	filter lfo's running				
7	lazer	turn the modwheel				
8						
9						
10						
11						
12						
13						
14						

Instruments Pool: divided into 128 rows (programs) and 128 columns (banks).

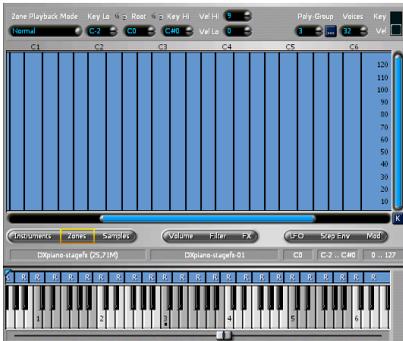
<sup>1</sup> Roland GS standard: General Synthesizer standard, broadens the GM (General MIDI) standard to include the "Bank Change" command which enables you to switch between different versions of an Instrument.

### 6.4.3 Zone

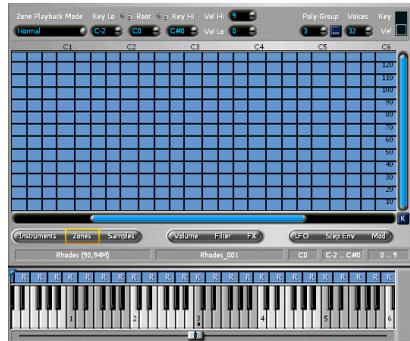
An Instrument consists of one or more (max. 32768) Zones. Each Zone contains one single Sample. Whenever you load a Sample in VSampler, it is automatically packed into a Zone. On the Zones page of the Editor View, the Zones are displayed graphically. Double-clicking a Zone takes you to the underlying Sample in the Sample Editor.

In it's simplest form, a VSampler Instrument can consist of a single Zone whose Sample is played across the entire range of the keyboard. In order to emulate the dynamic behavior of natural instruments, it can also consist of hundreds of Zones (see screenshot) mapped to different ranges of the keyboard (Key Zones) and velocity ranges (Velocity Zones). As opposed to the naked Sample, a Zone contains a wide range of parameters which determine how the Sample is to be played, such as:

- Key Range and Velocity Range, in which the Sample is played back (see screenshots)
- envelopes and settings for volume, filter, effects and modulations
- conditions which determine when a Sample should be played, e.g. when releasing a key instead of when striking it, or upon reaching a certain controller value



different Samples per key (Key Zones)



... and per velocity level (Velocity Zones)

Each Zone contains exactly one Sample. Other Zones however can also use the same Sample. Each Zone however, can have a different Voice structure and apply different parameter settings. The same Sample can sound completely different in different Zones. VSampler automatically recognizes when multiple instances of a Sample are used, it occupies memory only once. This way for

example, a variation of an Instrument can be made by copying it per drag & drop in the Instruments Pool (cloning), and then altering the Zone parameters, without using up any more memory.

The complete description of all Zone parameters can be found in the Reference Manual. A few interesting parameters are:

- soft crossfade between neighboring Zones
- playback modes, among other types: tape machine mode (Tap On/Off) to start and stop the playback of a Sample by repeatedly tapping the same key, or Drum mode to play VSampler using a drum pad, ignoring the Note-Off MIDI message caused by the immediate release of the drum stick being lifted
- Organization of Zones in groups:
  - Selection Groups: when using complex Instruments, they support the organization of Zones which share the same settings
  - Cycle Groups: enable e.g. the random playback of different Samples
  - Poly Groups: enable you to limit the polyphony, and also offer the special “exclusion” mode, e.g. in order to define a typical hi-hat group in which the closed hi-hat stops playback of the open hi-hat

#### 6.4.4 Sample

The Sample is the digitalized sound itself, which in the form of a WAV file can also be played back for example in Windows Media player. VSampler loads Samples in both WAV and AIF format. It supports every sampling frequency by resolutions of 16/20/24/32 bit. The sampling frequency of the playback is limited only by the output device. Of course, VSampler supports all common output formats from 16 bit / 44kHz up to 32bit / 192 kHz.

VSampler’s integrated Sample Editor offers all essential sample-editing functions. The integrated Auto Looper enables the automatic detection of appropriate loop points in order to play back a Sample longer than it was originally recorded, when holding a note. The integrated Beat Detector automatically slices drum loops into single hits, so that the tempo and pitch of the loop can be altered in real-time independently and without sound quality loss. Double-clicking a Zone on the Zone page takes you directly to the underlying Sample. For further information regarding the possibilities of the integrated Sample Editor, please see the Reference Manual.

### 6.4.5 Multi

As described in section “6.2.3 The 16 MIDI channels” on page 102, VSampler is a 16-channel multitimbral instrument, i.e. by using all 16 MIDI channels, it can playback up to 16 different Instruments simultaneously.

The term “Multi” refers to a particular combination of Instruments being assigned to the 16 MIDI channels. Up to 64 such combinations can be named and saved, so that it is possible to easily switch between sound set-ups, i.e., all 16 MIDI channels can be switched at once by selecting a different Multi.

## 6.5 Dynamic Resource Control (DRC)

### 6.5.1 The advantage

DRC enables VSampler to load and playback Soundlibraries and Instruments of any size, you are not limited to the size of your main memory (RAM). When DRC is activated, VSampler dynamically manages your computers RAM by loading and unloading Instruments and Samples from your hard disk as necessary in the background.



Sample level DRC is not available in the VSampler 3.0 OEM version, see “1.5. OEM Version vs. Independent Version” on page 20.

The DRC settings can be found in the menu “Options | Audio | Performance / Quality” on the "Performance" tab, see also “5.4.4 Optimizing DRC” on page 90. DRC operates on 2 levels which are by default both activated:

### 6.5.2 Instrument level (DRC 1)

DRC 1 has been available since VSampler version 3.0. Instead of all Instruments of the Soundlibrary, only the currently active Instruments are loaded into RAM. Those are the Instruments currently assigned to a MIDI channel.

- **Advantage:** You can manage as many Instruments as you wish<sup>1</sup>. This way, you have all candidates for your song at your disposal, and they can be easily compared and exchanged.
- **Disadvantage:** Switching to another Instrument by mouse click or “program change” message may be delayed, because the new Instrument must be loaded from the hard disk first.

For further information, please refer to section “5.4.4 Optimizing DRC” on page 90.

### 6.5.3 Sample level (DRC 2)



DRC 2 has been available since VSampler version 3.1. Instead of all Samples of the Soundlibrary, only the active Samples are loaded into RAM.

- **Advantage:** You can playback Instruments of any size<sup>2</sup>.
- **Disadvantage:** When you play back highly polyphonic Instruments (see “6.6. Polyphony” on page 114), the increased effort of dynamic memory management places high demands on the processor and the hard disk. Since the access time of the hard disk is significantly lower than that of RAM, the maximum polyphony is reduced.



The Sample of the currently selected Zone is always in RAM, so that it is available in the Sample Editor.

If you experience drop-outs with highly polyphonic Instruments, do not immediately switch off DRC 2, but follow the instructions in the section “5.4.4. Optimizing DRC” on page 90.

### 6.5.4 Maximum size of Instruments

The maximum size of playable Instruments is – technically speaking - of course not unlimited, because the size of your hard disk isn’t infinite either. Practically speaking however, the problem of “maximum Instrument size” does not exist. When DRC2 is activated the only limitation is the Windows-specific file size-limit, depending on how your hard disk is formatted:

<sup>1</sup> maximum 16384, i.e. 128 rows x 128 columns

<sup>2</sup> see the next section “Maximum size of Instruments”

- **FAT32 (Windows 98, ME):** max. 4 GB per file, which corresponds to a sample length of approx. 7 hours in CD quality
- **NTFS (Windows 2000, XP):** max. 2 TB per file, which corresponds to a sample length of 144 days in CD quality - in this case the limitation is more likely to be due to the size of your hard disk ...

If your Soundlibrary uses the standard setting of “linked Samples”, then the above mentioned limit applies per Sample. With “embedded Samples” the restrictions apply to the entire Soundlibrary file.

## 6.6 Polyphony

### 6.6.1 The more, the...?

The word “polyphony” refers to the number of Voices that an Instrument can play back simultaneously. The higher the polyphony, the more realistic the sound when numerous Instruments are simultaneously played back by a multi-track sequencer. But also the higher is the demand for processing power.

Classical hardware samplers (e.g. Akai S3000) had 32-Voice polyphony, i.e. a maximum of 32 keys can simultaneously produce sound. This is however only a half-truth so to speak, because only mono Voices are counted: Stereo Samples cut the “felt” polyphony in half. If an Instrument furthermore consisted of several simultaneously-played sample layers (multi-layer), the polyphony would be further reduced.

### 6.6.2 Counting Voices

Polyphony is a relative term. As described in the previous section, different sampler producers count the number of simultaneously playable Voices in different ways (even today), for example by advertising the polyphony in rather untypical mono-Voices.

VSampler has real 255-voice polyphony. This number remains constant, whether you use stereo Samples or multi-layer Instruments. As with all software instruments: provided that the processing power is sufficient. The number of currently active Voices is shown at the top right corner of the main window:



With the right mouse button, the display can be switched between:

- Note Voices: the number of notes being played back, max. 255
- Zone Voices: the number of Zones being played back, max. 255 notes x 16 layers = 4080

For the purpose of limiting the polyphony (see 5.4.2. on page 87) VSampler counts as follows:

- on the global and Instrument level: the Note Voices
- on the Zone level (Poly Groups): the Zone Voices

Tip: If you have assigned Zones within an Instrument to different output channels or Group Effects, then VSampler must calculate these separately, independent of whether they are mapped to the same key. Therefore, in this case several notes are counted. Keep an eye on the number-of-Voices display, and adjust the polyphony limit appropriately.

For more information about limiting the polyphony see 5.4.2. on page 87.

## 6.7 Archiving and Internet Exchange of Soundlibraries

For the purpose of archiving and for exchanging Soundlibraries over the Internet, VSampler offers a unique solution: it enables the loading and saving of compressed Soundlibraries that are significantly smaller than the uncompressed standard types. These compressed Soundlibraries have the file extension VC3. The installation of a special compression program is not required. Depending on the intended usage, you have the choice between two types; see the pull down menu item “Export | Export compressed library”:

### FLAC, lossless

FLAC ([flac.sourceforge.net](http://flac.sourceforge.net)) is perfect for archiving purposes. All details are completely preserved. It reaches a compression of ca. 2 : 1, and compresses somewhat better than Rar/Zip/Ace.

### **Ogg Vorbis, lossy**

Ogg Vorbis ([www.vorbis.com](http://www.vorbis.com)) is perfect for exchanging larger Soundlibraries over the Internet. The compression ratio can be freely adjusted; default setting is 50% quality at variable bitrate. Depending on the type of audio material this results in a compression rate of about 10:1, while the quality difference to the uncompressed original is difficult to hear even for trained ears. At the same compression rate Ogg Vorbis is superior to the somewhat dated MP3 format, as e.g. the result of a big public listening test of the German computer mag „c’t“ confirms:

[www.heise.de/newsticker/data/anw-08.09.02-000](http://www.heise.de/newsticker/data/anw-08.09.02-000)

## **6.8 Optimizing the PC for Audio Performance**

### **6.8.1 Purchasing decisions: hardware**

A hardware sampler is nothing other than a pre-configured package consisting of a software sampler and hardware – a closed system with pre-defined characteristics and fixed processing power. In the best case, you have the choice between a handful of add-ons provided by the sampler manufacturer.

In comparison with this, VSampler as a software instrument is part of an open system which each user can assemble to suit their own needs. This is cost-effective, because the PC already includes the complete hardware, and future hardware upgrades benefit the entire system, including VSampler. There is a huge selection of components available produced by various manufacturers - whether it's an effect plug-in or a soundcard. Here is some decision-making help concerning the 5 most important hardware components, starting with the simplest.

### **CPU (Processor)**

The faster the CPU the better. When running on a system with the current generation of processors from AMD or Intel, the performance of VSampler is significantly better than that of most hardware samplers. Here is an indication: on a somewhat dated Pentium III with 700 MHz, VSampler achieves a polyphony of up to 120 stereo Voices. The number is naturally reduced by the use of filters, effects and modulations when using VSampler in actual practice. Usually, in addition to VSampler, other instruments and effects are also active which also require processing power. The playback frequency of the entire digital

studio also plays a role. An increase from 44 kHz to 96 kHz increases the amount of data to be processed at the same ratio, and correspondingly reduces the maximum polyphony.

Since VSampler uses separate threads for DRC-, graphic-, and audio engine, it benefits from the use of a multi-processor system and also Intel P4 processors with Hyperthreading technology.

### **RAM (main memory)**

The more RAM, the better. Upwards of 512 MB work will be a pleasure. VSampler's DRC (see page 112) enables you to load and playback Instruments of any size, not limited by the RAM size. However, DRC places high demands on the processor and the hard disk. Because the access speed of the hard disk is significantly slower than the RAM access speed, more RAM reduces the load on processor and hard disk. The result is an increased polyphony when using larger Instruments.

Tip: If you work mostly with very large detailed sampled natural instruments, then the amount of RAM is more important than the speed of your CPU. On the other hand, if you work mostly with synthesizer sounds, and use lots of VSampler's features, then a fast CPU is more important than much RAM.

### **Hard disk**

The faster, the better. The hard disk should have at least 7200 rpm, and support U-DMA 100 (or higher) or SCSI. If you would like to orient yourself on test reports (e.g. [www.storagereview.com](http://www.storagereview.com)) your hard disk should have low access times, as well as a high "minimal transfer rate". In practice, when your drive space is getting full, this value is more important than the "maximum transfer rate", which is only reached at the fastest areas of the hard disk.

Ideally, you should use two physical hard disks (not partitions): The first for Windows, programs and swap file, the second for the audio files. This way the operating system and VSampler don't get in each others way when accessing the hard disk. An even more elegant solution is to use a RAID<sup>1</sup> system, with RAID level 2 or higher. Do not be tempted to use RAID level 0 – the performance advantage is not worth the risk. Please refer to the appropriate specialized literature, and/or inform yourself on the Internet.

---

<sup>1</sup> Redundant Array of Independent Disks: merges the capacities of several hard disks in order to simultaneously read and/or write data and thus increase hard disk access speed and/or reduce the risks of a breakdown.

## Soundcard

In a purely digital system consisting of a sequencer, plug-ins and sampling CDs, the soundcard has no influence on the quality of the mixdown<sup>1</sup>. It does however determine the quality at which you can hear your mix while working on the song. The occasional recording of an instrument can be handled, better or worse, by almost any soundcard. If however, you are interested in making high-quality recordings, you should invest a little more in order e.g. to get yourself a soundcard with an external A/D converter. A good soundcard can accompany you over several computer generations, and is worth the investment.

Particularly for the use with software instruments, two qualities are important:

- **low latency**<sup>2</sup>: For delay-free live performance, the latency should be lower than 15 ms, ASIO drivers tend to offer lower latencies than DirectSound drivers.
- **reliable drivers**: Inform yourself on the manufacturer's website or in independent forums as to the frequency of past driver updates. Regular updates over a period of several years are a sign of good product maintenance.

## Operating system

Regarding an operating system, the old saying is still valid: never touch a running system. If you are satisfied with your Windows version, stick with it. Generally we recommend the Windows versions 2000 or XP. As far as audio is concerned, it makes no difference whether you use XP Professional or XP Home edition – unless you own a multi-processor system:

If you own a (real) multi-processor system, you have the choice between Windows 2000 and Windows XP Professional. Windows XP Home doesn't make sense, because it only supports one physical processor.

Owners of Intel Pentium 4 processors with Hyperthreading technology, should only use Windows XP with Service Pack 1 or above. As far as audio processing is concerned, it makes no difference whether you use XP Home or Professional. For more information concerning the differences between the various Windows versions, see the [Microsoft website](#).

---

<sup>1</sup> Mixdown: all tracks of a song are mixed (e.g.) into a WAV file, in order e.g. to burn the file on a CD.

<sup>2</sup> Latency: delay between striking a key and sound output.

### **6.8.2 Optimizing Windows XP for audio processing**

In the following section, we will offer a few tips to optimize the audio performance of your computer when using Windows XP, they generally apply to other Windows versions as well. All tips are non-binding. Try them at your own risk. We do not guarantee success, nor are we liable for any resulting damages to your system.

#### **Set up a separate user account**

- In Windows, set up a separate user account for audio purposes, so that you can make special settings for audio without changing your normal settings.

#### **Improve hard disk performance**

- Make sure that Ultra DMA mode 4 or higher is activated for your IDE hard disks. Start the Windows Device Manager, open the item “IDE ATA/ATAPI-Controllers” and in the properties (right mouse button) of “Primary IDE channel” (and if available also of “Secondary IDE channel”) choose the “Advanced settings” tab and, if necessary, change the setting for the Transfer Mode.
- Defragment your hard disk(s) at regular intervals to retain low access times with the ever-changing content of your hard disk. Particularly when using DRC, the performance (and with it the polyphony) sinks noticeably when the hard disk is overly fragmented. Start the defragmenting program manually; automatic defragmenting in the background should be avoided.

#### **Improve reaction time and reduce ASIO latency**

- Switching the system performance optimization from “Programs” to “Background services” in the Windows control panel. This option is accessed under “Performance and Maintenance | System | Advanced”.

#### **Improve stability**

- Deactivate screen savers and energy saving features.
- Deactivate all scheduled and background tasks. Instead, start them manually when needed, e.g. virus scanner or hard disk defragmenter.
- Deactivate the System Recovery for all drives, since Windows might otherwise choose an inappropriate moment to save a new System Recovery state: “Control Panel | System | System Recovery”

## 7 Support

### 7.1 Contact

We are looking forward to your feedback about VSampler! Can we improve something? Do you have questions? Feel free to pay a visit to our website [www.vsampl.com](http://www.vsampl.com), to get help either by reading the FAQ (Frequently Asked Questions) or by contacting us in the public user forum or by eMail.

### 7.2 Updates

Our website [www.vsampl.com](http://www.vsampl.com) will be at your service to tell you about recent news, latest product versions and available updates. As a registered website-user you can subscribe to the VSampler newsletter to get first hand information about VSampler news.

**SPEEDSOFT**  
[www.vsampl3r.com](http://www.vsampl3r.com)



**MAZ**  
SOUND TOOLS  
[www.maz-sound.com](http://www.maz-sound.com)