

PC  
VERSION

OPERATION MANUAL

ENG

# VSL 2020

Audio Card for VST System Link

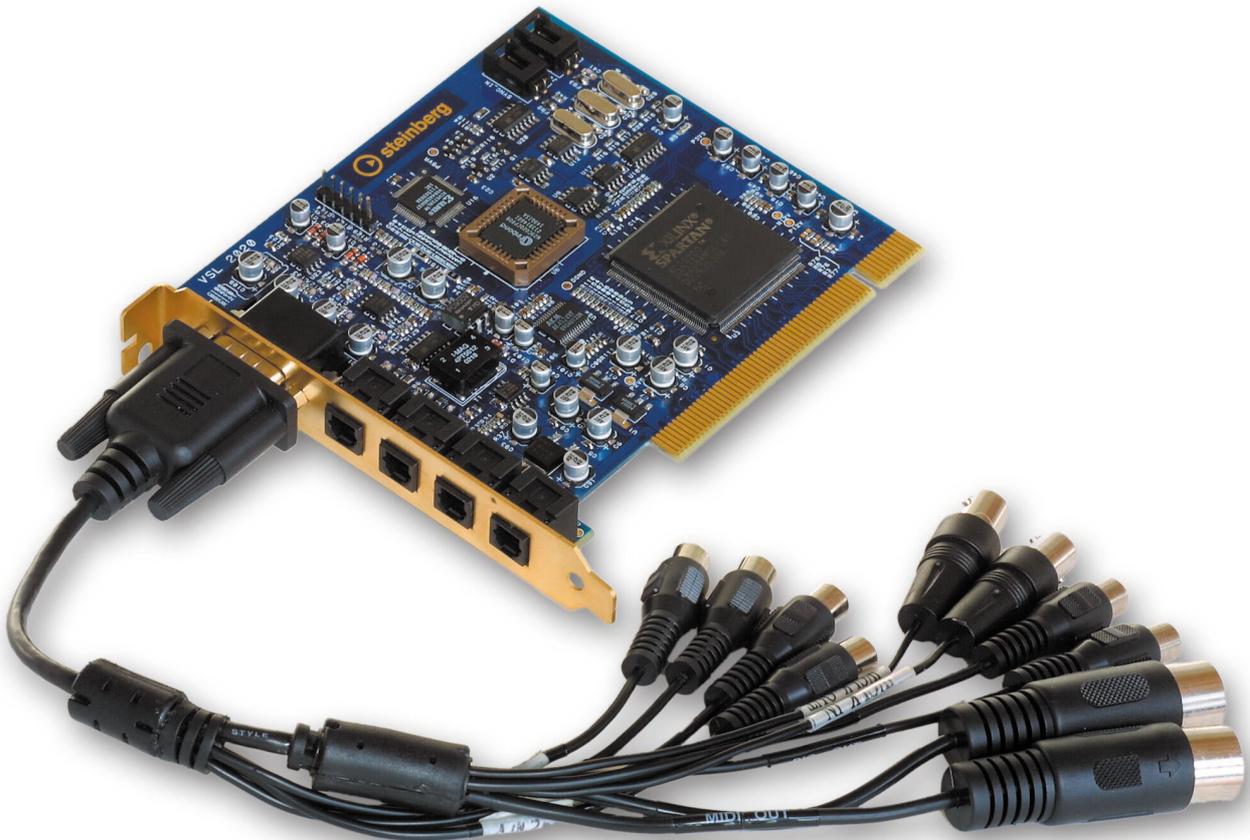
 **steinberg**

## 1. Introduction

Thank you for choosing the Steinberg VSL2020 audio card. The VSL2020 digital audio card/interface is designed specifically for use with VST System Link, Steinberg's networking technology, allowing sample accurate sync between several computers connected using simple optical digital cables.

VSL2020 provides 32 ADAT channels for pristine transmission of audio and MIDI data to and from the other computers in your network. Full support of ASIO 2.0 ensures stable, low-latency multi-channel network operation with other computers running Cubase SX/SL or Nuendo. The supplied V-STACK software hosts up to 16 VST instruments, and provides 8 send effects, 5 insert effect slots and 4 master bus effects for your VSTi sounds. Let the VSL2020 card and V-STACK increase the available music making power in your studio.

VSL2020 and V-STACK can also turn your PC into a live virtual instrument station. The VSL2020 low latency architecture allows dynamic real-time playing of VST instruments. V-STACK supports VST, VST 2.0 and Direct X plug-ins, allowing you to load up to 16 VST instruments in V-STACK, add high-quality effects and play them live through the VSL2020 audio interface. All this in the same pristine 32 bit floating point audio quality users of Cubase SX/SL and Nuendo have become accustomed to.



## **2. Package contents**

VSL2020 PCI card

V-STACK CD

Adapter cable (D-type with digital and analog inputs and outputs)

## **3. System requirements**

Minimum system requirements:

Processor: Pentium 233 MHz

RAM: 128 MB of free RAM

Operating system: Windows 2000, Windows XP

Sound card: supports ASIO 2 spec for high-end multi-channel audio cards,  
supports Windows MME & DirectSound spec for standard sound cards

Recommended system:

Processor: Pentium 4 or AMD K7 XP with 1 GHz

RAM: 512 MB of free RAM

Operating system: Windows 2000, Windows XP

Sound card: supports ASIO 2 spec for high-end multi-channel audio cards,  
supports Windows MME & DirectSound spec for standard sound cards

## **4. Characteristics**

PCI Busmaster interface

ADAT, S/PDIF and analog outputs can be used simultaneously

S/MUX technology for using the ADAT channels with 24 bits/96 kHz

Word clock in master and slave mode

Word clock input and output

## **5. Technical specifications**

### **5.1 Digital**

Low-jitter S/PDIF (32, 44.1, 48, 88.2, 96 kHz)

Low-jitter ADAT (32, 44.1, 48, 88.2, 96 kHz)

Sample frequencies: 32, 44.1, 48, 64, 88.2, 96 kHz

Coaxial S/PDIF I/O

Word clock I/O

### **5.2 Analog**

RCA connector input and output (24 bits/96 kHz)

### **5.3 MIDI**

MIDI input and output via adapter cable

## 6. Hardware installation

- a.) Make sure that the computer is switched off and that the power cable is disconnected from the mains supply before installing the VSL2020.
- b.) Before removing the VSL2020 from the protective bag, discharge any static in your body by touching a metal surface.
- c.) Open your computer's housing and insert the VSL2020 into a free PCI slot. Make sure that the card is locked firmly in the slot and fasten the screw.
- d.) Connect the adapter cable to the card.
- e.) Replace the computer housing.
- f.) Reconnect all cables including the power cord.

## **7. Software installation**

### **7.1 Windows ME**

Once the hardware has been installed successfully (see section 6), Windows will recognize the new hardware component and start the “Add new hardware wizard“. Please insert the Steinberg V-STACK CD into your CD-Rom drive and follow the on-screen instructions. Afterwards, you should restart the system to make sure that the card driver is recognized within your Windows system.

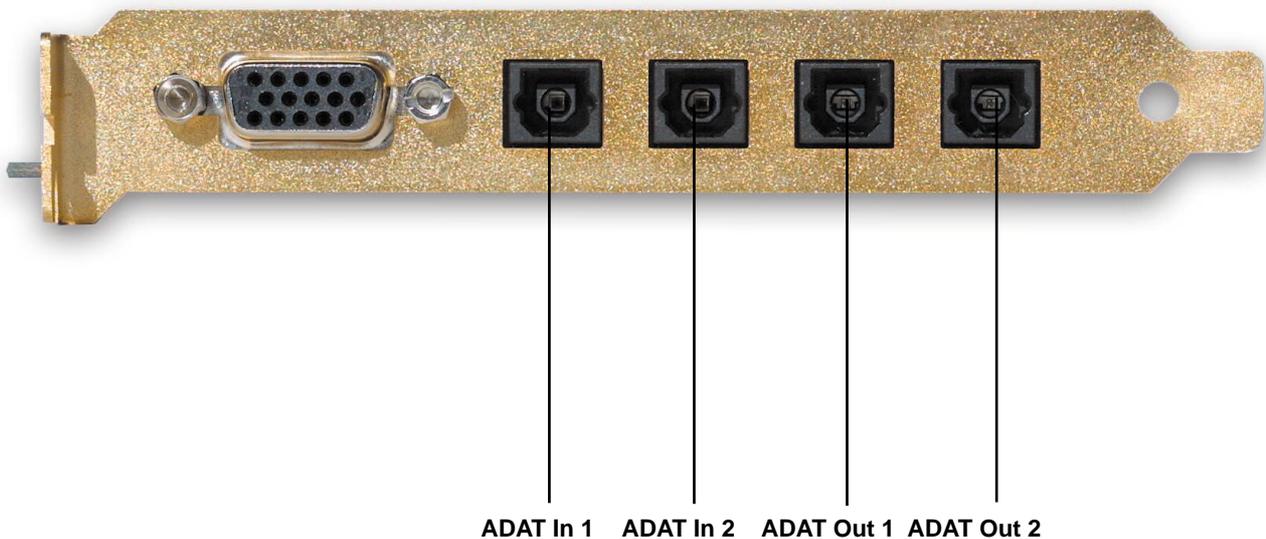
### **7.2 Windows 2000 and Windows XP**

The EWDM driver is easy to install under Windows thanks to the Plug and Play routine. Once the hardware has been installed successfully (see section 6), Windows will recognize the new hardware component and start the “Add new hardware wizard“. The driver is located in the VSL2020 folder on the V-STACK CD. If the wizard informs you that the driver is not certified, this is not a problem. Click “Install anyway“ and install the driver. Afterwards, you should restart Windows to make sure the driver is working correctly.

## 8. Connections of the VSL2020

### 8.1 ADAT

The VSL2020 provides different types of inputs and outputs, directly on the card and via an adapter cable. Directly on the card you can see two ADAT inputs (ADAT In 1 and 2 on the left) and two ADAT outputs (ADAT Out 1 and 2 on the right). In normal mode the ADAT connection supports a sample rate of up to 24 bits/48 kHz. With the S/MUX technology it is possible to use the ADAT inputs/outputs with 24 bits/96 kHz. ADAT can only transfer 4 channels at 24 bits/96 kHz via one ADAT port, so you need to connect both ADAT outputs to get 8 channel transfer.



## 8.2 S/PDIF

The VSL2020 supports a coaxial S/PDIF input and output.

The supported sample rates are: 32 kHz, 44.1 kHz, 48 kHz, 64 kHz, 88 kHz, 96 kHz.

The resolution is 24 bits (internal 32 bits).

## 8.3 Analog

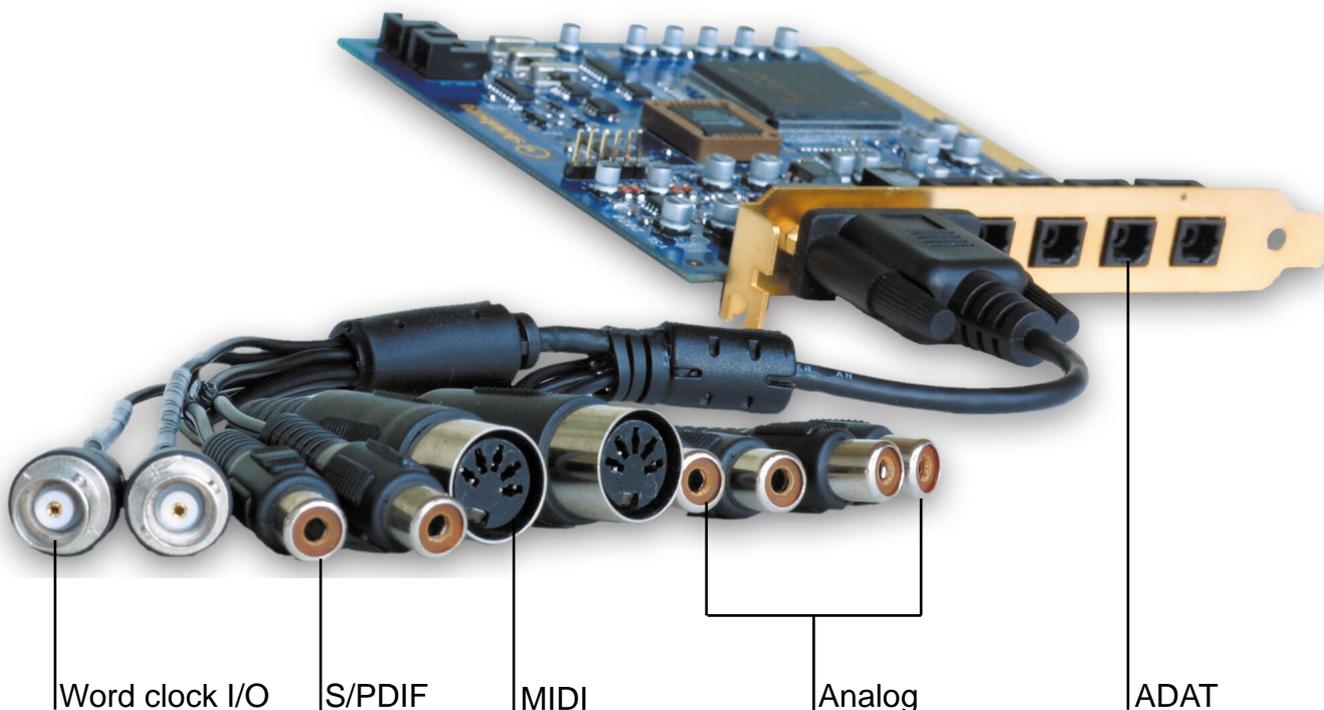
On the adapter cable you will also find two RCA analog inputs and outputs, for example to connect directly to your local hifi system. This is an unbalanced (-10dBV) RCA-type I/O, which supports a sample rate of up to 96 kHz and a resolution of up to 24 bits.

## 8.4 Word clock

The VSL2020 supports word clock input and output. The BNC connector (FS/256xFS) can clock external devices via the word clock output and can be slaved to external devices via the word clock input. You can adjust the word clock settings via the control panel.

## 8.5 MIDI

The VSL2020 also supports MIDI on the adapter cable. It is a 16 channel in/out interface with the standard MIDI connector.



## 9. Control panel

The control panel is used to configure your audio card. Once you have successfully installed all hardware and software and rebooted the system you will see a Steinberg logo on the right-hand side in your taskbar. Click this icon to open the control panel. The control panel provides several options that help you adapt the card to the requirements of your working environment (digital mixers, AD-DA converters, V-STACK systems, etc.).



## 9.1 Control panel window

In the control panel, below the menu bar, all ADAT bus names are listed. On the left you find the inputs from ADAT-1 IN (1-4) to ADAT-2 IN (5-8), plus S for S/PDIF and A for analog. On the right-hand side you find all corresponding outputs. The names denote stereo busses, i.e. 16 ADAT channel inputs/outputs on 8 busses (2 channels each).

Below the channel level indicators is a row of buttons for muting individual inputs/outputs. You can mute all inputs or all outputs simultaneously by clicking the INPUT or OUTPUT buttons at the bottom of the window.

The current sample rate is displayed in the field above the master controls in the top right of the window.

Below the master controls are two pop-up windows.

The first is used to set the clock settings of the card. You can choose between Internal, ADAT-1 IN, ADAT-2 IN, S/PDIF or External.

Internal is for the internal 2 pin sync connector, ADAT-1 IN is for the sync from the ADAT-1 IN, ADAT-2 IN will sync to a clock signal received via the ADAT-2 IN, S/PDIF will sync to a clock signal received via the S/PDIF-IN, External will sync to a clock signal received via the word clock input.

Below that you find the routing pop-up. The default setting is NONE. If NONE is chosen the routing is 1:1, which means that ADAT-1 Out is routed to ADAT-1 Out, etc. Or you can route your signal to a specific ADAT output ( ADAT 1.1 or ADAT 1.2, etc.). You can also route your signal to the analog out. You can also choose S/PDIF as the monitor-out.

## 9.2 Configuring the VSL2020

The control panel provides two menus called File and Config. The File menu is used to exit the control panel. The Config menu provides a number of options for the configuration of your card. The following sections describe the configuration options.

### 9.2.1 Mouse Wheel

The first submenu is called Mouse Wheel. If you are using a wheel mouse, you can use the options in this submenu to set the “resolution” of the wheel action, i.e. how far the sliders move when moving the wheel. Step 1 is the “finest” and Step 8 the “coarsest” resolution.

### 9.2.2 Latency

The second submenu is called Latency. Here you can set different buffer sizes for the ASIO 2.0 driver.

There are 2 different sections:

A list of buffer sizes from 128 samples (3 milliseconds at 44.1 kHz) to 2048 samples (48 milliseconds at 44.1 kHz) and Ultra Latency, with buffer sizes from 96 samples (2,5 milliseconds) to 32 Samples (0.75 milliseconds). When you are using a VST host program that supports ASIO 2.0 you should start with a latency of 256 samples or 512 samples to see if card operation is stable with your configuration. If you are only using VST instruments you can lower the buffer size to achieve better playing performance. Everything under a buffer size of 512 samples will not be heard as latency. An advanced piano player should use a buffer size below 256 samples.

### 9.2.3 Factory Default

The third submenu is called Factory Default, which simply resets all settings to the factory defaults of the VSL2020.

### 9.2.4 Always on Top

When you activate the Always on Top option, the control panel will always be the top window, regardless of what other application windows are open.

## 9.2.5 Hardware Configuration

This option opens the dialog for hardware configuration.

**Internal Clock** can be set to 32, 44.1, 48, 64, 88.2 or 96 kHz. **External Clock** determines from which source you receive a clock signal. The card then functions as a clock slave to an external clock device. Sources could be ADAT 1 or ADAT 2 or S/PDIF and Extra (word clock).

When you activate the **S/MUX** option, the sample rate on the ADAT ports is increased to 96 kHz. Since ADAT streams are normally limited to a maximum 48 kHz, you have to split the audio stream to create two 4-channel audio streams. You can then transfer a signal of 8 channels with 24 bits/96 kHz. Your ADAT digital mixer or AD-DA converter must also support this feature, otherwise you cannot hear the signal.

The **Extra In Clock** setting can be either Card Sync, Word, FS or FS 256.

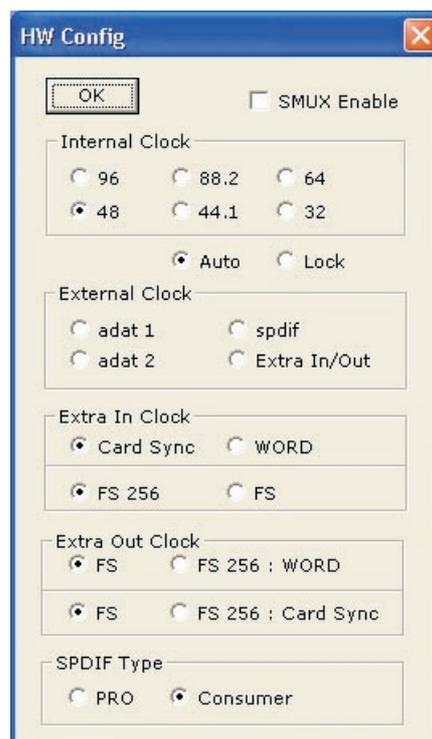
Card Sync refers to the 2 pin connector on the card. Word is taking an incoming word clock signal as the sync source. FS 256 will sync your system to a super clock.

The **Extra Out Clock** option will slave external devices to your internal clock settings.

You can choose between two settings: FS, which is normal word clock, or FS 256, which is super clock, transferred through the word clock output connector.

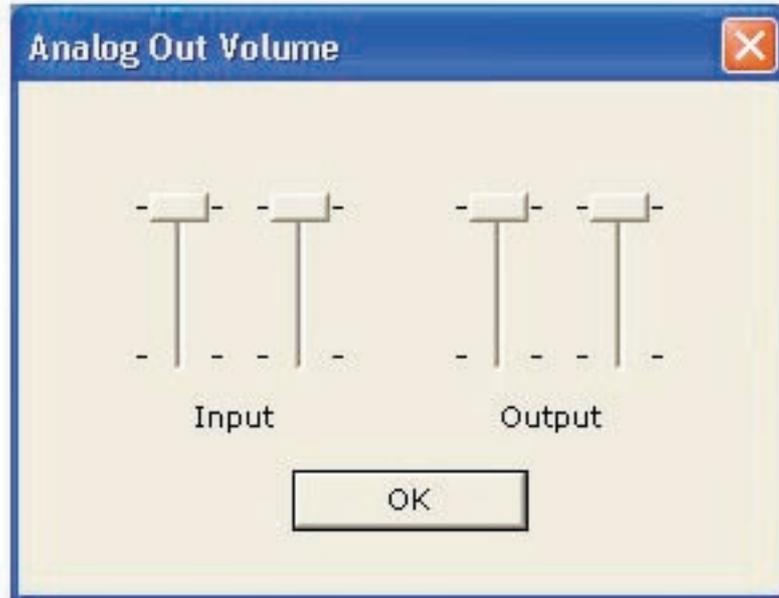
The **S/PDIF** type is either Pro, i.e. AES/EBU, or Consumer, which is the normal coaxial S/PDIF used to connect to your home hifi system.

You can set the internal clock to either **Auto** or **Lock**. If you choose the Auto option, the card will sync to an incoming audio clock signal received from a host application like Cubase or Nuendo. If you choose the Lock option, you lock the settings for the internal clock, i.e. even if applications try to access the card with a different sample rate it will not follow. Note that this can sometimes cause errors with programs that do not support your selected sample rate!



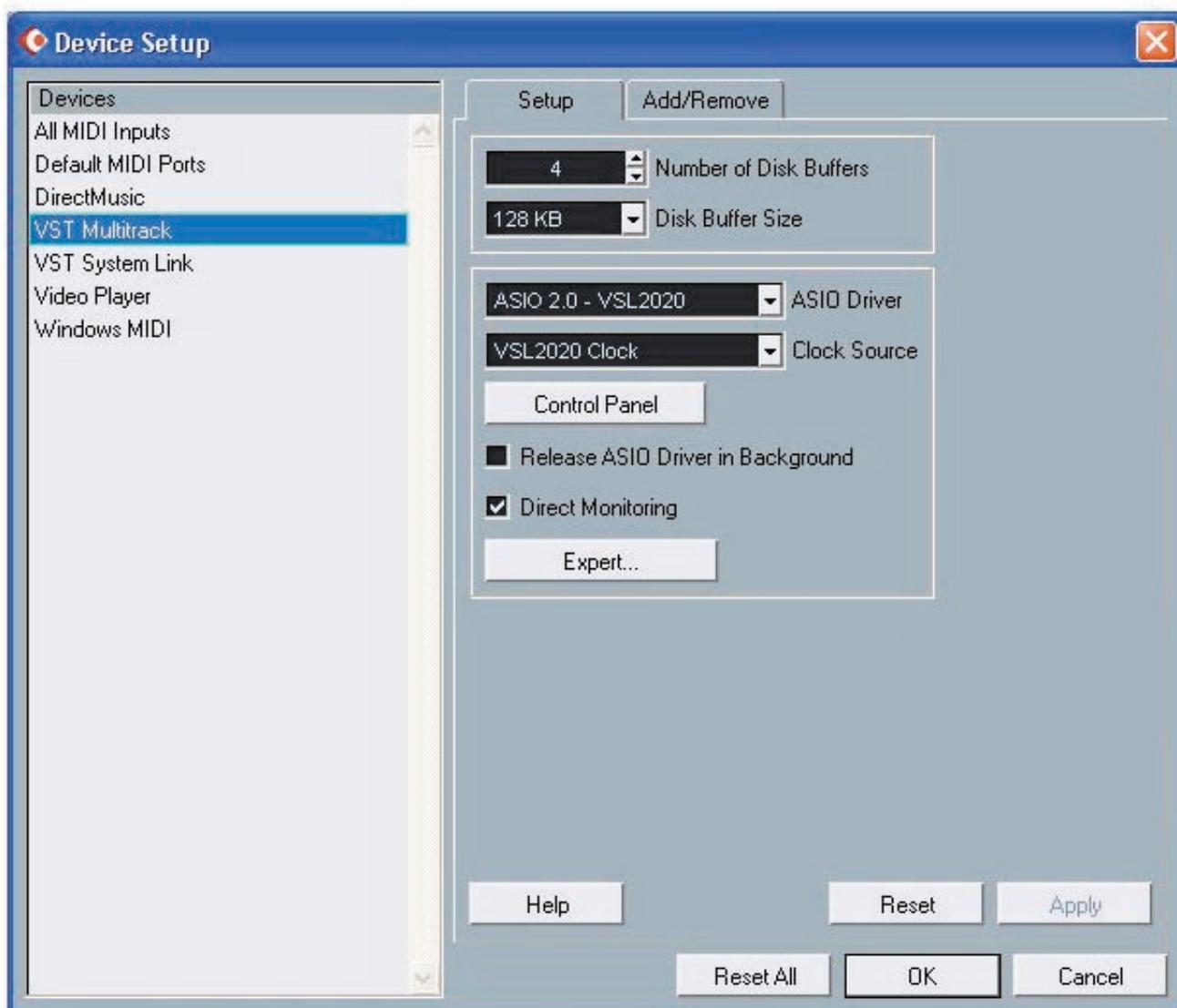
## 9.2.6 Analog Mixer

The Analog Mixer option opens a dialog where you can set the output level and the input level of the analog connectors.



## 10. Working with ASIO 2.0

Once you have successfully installed the VSL2020 card, open your host application (e.g. Cubase or Nuendo), open the Devices menu and choose the Device Setup option. In the Devices list, select VST Multitrack. On the Setup tab, select the ASIO 2.0-VSL2020 driver from the ASIO Driver pop-up. Click the Control Panel button to open the card control panel if you want to make your settings from within your host application.

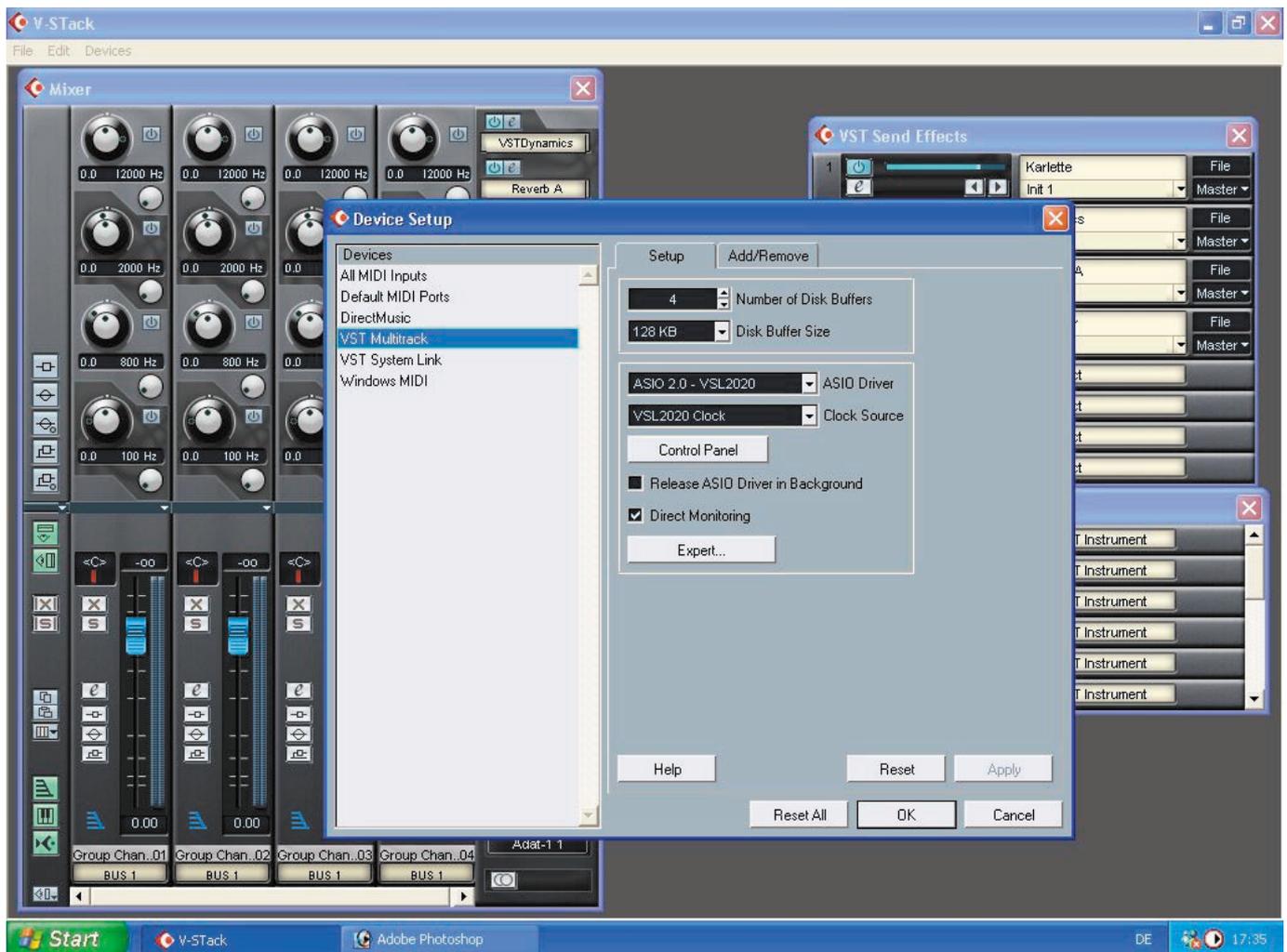


## 11. Working with V-STACK

You can use the VSL2020 card with any VST host application that supports ASIO 2.0, e.g. Cubase or Nuendo. The V-STACK software supplied with your card is also a ASIO 2.0 compatible VST host application, and can be used in combination with another computer running Cubase or Nuendo.

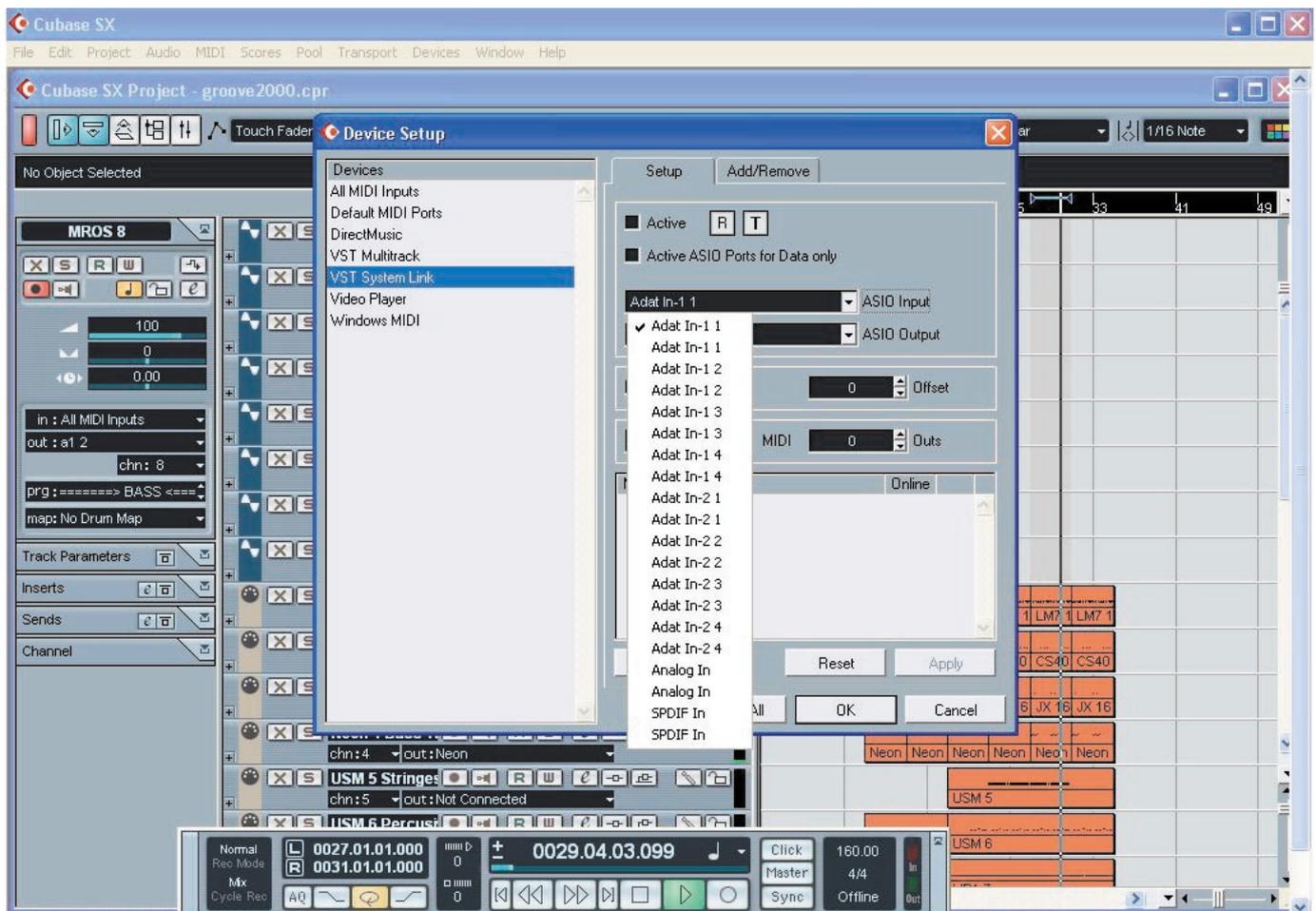
With V-STACK you can set up a VST System Link network synchronized via the ASIO 2.0 protocol. Just like Cubase or Nuendo, V-STACK provides the Device Setup dialog where you can select the VST Multitrack device and choose the ASIO 2.0-VSL2020 driver option from the ASIO Driver pop-up menu. In the Devices list, select Default MIDI Ports and set the VSL2020 MIDI input and MIDI output as your desired MIDI ports.

Once these settings are made, select VST System Link from the Devices list, select Active and set up the connection to the “master PC” in your network. You can then communicate with the “master computer”, provided that VST System Link is activated and running.



## Some things to check and observe when using V-STACK

- The first and most important step is to link each computer so that each shows in the list of connected computers without errors. Please make sure that everything is properly locked and clock synced.
- You need to get the audio clock straight, one (!) machine must be clock master, all others must be properly configured for clock slave operation! This is essential for smooth operation of the network!
- All machines with loaded projects have to use the same sample rate!
- Make sure to use digital cables when connecting via S/PDIF, normal analog RCA (audio) cables will not work!
- Always use 32 bit ASIO drivers! 16 bit drivers will most likely not work. Some ASIO drivers have different bitwidth when using certain buffer sizes.



## **12. Compliance and copyright statements**

### **CE**

This device has been tested and found to comply with the EN55022 Class A:1998+A1:2001 and EN55024:1998 norms for digital devices, according to the European Council directive on the counterpart laws in the member states relating to electromagnetic compatibility (EMVG).

### **FCC**

This device has been tested and found to comply with the requirements listed in FCC Regulations, part 15 class "A" digital device. FCC compliance statement: Tested to comply with FCC standards for home or office use.

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