# HardSID 4U user's guide

## HardSID 4U Studio Edition HardSID 4U Standard Edition



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## Safety information

## Don't touch the metallic parts of any cables. Possible difference in grounding potential of different equipments may cause electric shock!

- Carefully read this manual before connecting/using the unit.
- Before using the product, make sure SIDs are installed correctly and voltage jumpers are set up accordingly.
- Use working non-damaged SIDs only. Using damaged SIDs may cause damage to the unit.
- Before using the product, make sure all cables are correctly connected.
- To avoid short circuits, keep screws, paper clips, staples, etc... away from connectors, sockets and circuitry.
- Avoid dust, humidity and temperature extremes. Do not place the product in any area where it may become wet. Do not place the product in small closed places where air cannot circulate. (like a drawer or a case for example)
- Place the product on dry, stable surface with satisfactory air circulation.
- Always switch off the unit when not using it for a long time. (for more than a few hours)
- Always unplug the power supply from the AC connector when not using the unit for a long time. (for more than a few hours)
- If the device is broken, do not try to fix it yourself.

## Introduction:

Read this manual carefully before trying to connect/use your HardSID 4U. All the configuration/installation steps apply to both HardSID 4U versions: Studio Edition and Standard Edition.

#### Package contents

- HardSID 4U (Studio Edition or Standard Edition with or without SIDs installed)
- Extra filter capacitors for 6581 and 8580 SIDs (two-two extra pairs for both versions; two-two pairs for both versions pre-installed into the unit)
- Power Supply (optional)
- USB Cable (optional)

#### System requirements

- IBM compatible PC (or notebook) with one free USB 1.1 (or higher) compatible high-current port (high-current USB ports are usually on the back side of the computer)
- Microsoft Windows XP or Vista (32bit or 64bit) OS
- (Mac OS X support is under development)

#### Key features

- Low latency VSTi synthesizer engine with 8000Hz SID update rate for ASIO driven VST hosts
- Cycle-accurate C64 music playback (digitized sounds, high-speed tunes, etc...) with very low CPU utilization
- Stunning C64 Emulator game play with real-time digitized sounds
- ..and more!

#### Upgrading from PCI or ISA HardSID

- Learn about removing SIDs at appendix "How to remove SIDs carefully" and remove the SIDs from your ISA/PCI card
- Read this manual carefully to learn about configuring your HardSID 4U
- Learn about installing SIDs into the HardSID 4U at appendix "Installing SID chips video tutorial"
- To notify applications about the removed PCI/ISA HardSID, you need to remove this registry key: HKEY\_LOCAL\_MACHINE\SOFTWARE\Hard Software\HardSID

### About hardware

If you've received your HardSID 4U with no SIDs installed, you have to install the SIDs first before connecting and using the unit. Learn about installing SIDs and configuring the hardware at the "Installing SID chips" section.

#### Conncetors



#### DC-in

12V DC input connector. Connect the 12VDC power supply to this connector. The power supply must be able to provide at least 1A at 12VDC. If you've received the unit without a power supply, check the polarity before buying the PSU. (the inner pin is the positive) The unit is protected against wrong polarity. If the polarity is wrong, the color of the DC LED will become red after switching on the unit. Otherwise it will be green (correct polarity).

Always hold the plastic/rubber part of the cable, don't touch the metallic parts!

#### **USB** connector

Connect the unit to a USB 1.1 (or higher) high-current port. High-current USB ports are usually located on the back of the computer. Front-panel USB ports are usually low-current. (USB ports on notebooks are usually high-current.)

If you're planning to use the unit in a professional studio, it is recommended to use high quality full-speed USB cables with short length. Using long USB cables are not recommended for professional use. Always hold the plastic/rubber part of the cable, don't touch the metallic parts!

#### Mixed output (black)

The mixed output is the easiest way of connecting the HardSID 4U to an amplifier, soundcard, etc... It combines the sound of all installed SIDs into one mono output (the same signal on both channels of the stereo jack).

Using the mixed output is recommended for hobby usage, not for professional use. If you have serious equipment (mixer, professional soundcard/amplifier, etc...), you'd better use the dry outputs. Always hold the plastic/rubber part of the cable, don't touch the metallic parts!

#### Dry outputs (green)

The dry outputs (green) are the best way of connecting the SID outputs to professional equipment in a studio (mixer, amplifier, etc...).

There are two dry output jacks on the HardSID 4U. Both jacks are stereo.

The mono outputs of SID 1&2 are on the same stereo jack (1=right, 2=left).

The mono outputs of SID 3&4 are on the same stereo jack (3=right, 4=left).

Always hold the plastic/rubber part of the cable, don't touch the metallic parts!

#### Inputs (blue)

The SID has the ability of routing the incoming mono audio signal through its filter. This functions can be activated in a VST host application using the HardSID 4U VSTi. There are two (blue) input jacks on the HardSID 4U. Both jacks are stereo. The mono inputs of SID 1&2 are on the same stereo jack (1=right, 2=left). The mono inputs of SID 3&4 are on the same stereo jack (3=right, 4=left). Always hold the plastic/rubber part of the cable, don't touch the metallic parts!

#### Other controls

#### **On/Off switch**

Please read the safety information (right after the table of contents) before switching on the unit.

- Always switch off the unit when not using it for a long time. (for more than a few hours)
- Always unplug the power supply from the AC connector when not using the unit for a long time. (for more than a few hours)

#### DC LED

The color of the DC LED must be green after switching on the unit.

The unit is protected against wrong polarity. If the polarity is wrong, the color of the DC LED will become red after switching on the unit. Otherwise it will be green (correct polarity).

#### MSG LED

The MSG LED must become lit shortly after switching on the unit. It keeps blinking in firmware update mode. (firmware update mode will be covered by the future version of this manual when/if an updated firmware will be released for the HS4U)

#### The Power Supply

If you've received the unit without a power supply, check the polarity and the DC plug dimensions before buying the PSU.

- The power supply must be able to provide at least 1A at 12VDC
- The inner pin is the positive
- Plug dimensions: Inner diameter = 2.1mm; Outer diameter = 5.5mm; Contact length >= 10mm

The unit is protected against wrong polarity. If the polarity is wrong, the color of the DC LED will become red after switching on the unit. Otherwise it will be green (correct polarity). Always unplug the power supply from the AC connector when not using the unit for a long time. (for more than a few hours)

We ship various versions of this power supply: Sunny SYS 1308-2412 (2A at 12VDC):

http://www.sunny-euro.com/HTML/PRODUCTS/POWERSPL/SYS1308 W2E.html

#### **Installing SID chips**

Always install perfect / tested SID chips! Using damaged SIDs may cause damage to the HardSID 4U.

If you've received your unit with installed SIDs from us, you don't have to configure the unit yourself, as we always send it properly configured.

Installing SIDs into the HardSID 4U is easy:

- Install the SID in the right direction (learn about it below)
- Don't force the SID! You may brake some pins off otherwise..
- Check out the "Installing SID chips video tutorial" in the Appendix!

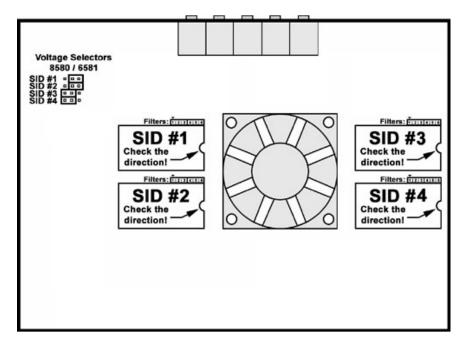
#### How to prepare the HardSID 4U for installing SID chips

After you've checked out the "Installing SID chips video tutorial" in the Appendix, start with the following:

- Switch off the unit
- Unplug all cables from it
- Remove the four screws from the bottom panel
- Remove the case from the board (the bottom panel will stay together with the printed circuit board!)
- Now, you're ready to install SIDs into the HardSID 4U

#### Socket numbering

Check the direction of the card (connectors on the upper side) and the numbering of the sockets before installing SIDs. Voltage jumpers must set accordingly for every socket. (1-4)



#### Supported versions, number of SIDs

The HardSID 4U works with any number of SIDs up to four. (1, 2, 3 or 4) All SID versions are supported in any combination. (6581, 8580, 6582)

#### The right direction

Always check the direction of the SID before installing it! Installing the SID in the wrong direction may cause damage to your HardSID 4U.

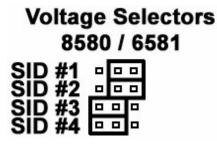
See the right direction on the picture:



#### Setting the voltage

You have to set the voltage of every SID chip you install depending on its version (8580 or 6581) by setting its voltage jumpers. Position "Left" is for the 8580, position "Right" is for the 6581.

You can see the voltage jumper layout on this picture:



#### The filter capacitors

The 6581 and 8580 versions of the SID chip are working with different filter capacitors. The 6581 needs two 470pF capacitors. (four pairs / 8 pieces are included in your package) The 8580 needs two 22nF capacitors. (four pairs / 8 pieces are included in your package) Since you can install any SID version into any SID socket, you'll have to choose/install the proper capacitors for every SID chip/socket.

You can find the filter capacitor socket at the upper-right corner of the SID socket.



Each SID needs two filter capacitors. There are six capacitor socket pins in the upper-right corner of each SID socket (2 capacitors \* 3 pins). Pins 1-2-3 for the first and pins 4-5-6 for the second filter. Pins 1-2 and pins 4-5 are the same, because you can buy the same capacitors with different widths. There are two-pin-wide and three-pin-wide ones. You have to install them aligned to the right. If you install wide capacitors, you can install them into pins 1-3 and 4-6, but if you have two-pin-wide ones you can simply install them into pins 2-3 and 5-6.

## Installing the device driver

Download the device driver for your OS from <u>http://www.hardsid.com/drivers\_apps\_docs.php</u> and extract to a folder before connection/turning on your HardSID 4U. Remember the folder (path) where you extracted the driver files. Your OS will ask for the device drivers after connecting and turning on your HardSID 4U. Please follow the following steps when installing the device drivers:

#### Installing the HardSID 4U 32bit or 64bit device driver on Windows XP

The very first dialog will ask you if you want to connect to Windows Update:

Answer: No, not this time.

Click Next.

The next dialog will ask you if you want to install the software automatically:

Answer: Install from a list or specific location

Click Next.

Found New Hardware Wizard	
	Welcome to the Found New Hardware Wizard     Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the windows Update Web site (with your permission).     Read our privacy policy     Can Windows connect to Windows Update to search for software?     Yes, this time only     Yes, now and givery time I connect a device     No. not this time
	< <u>B</u> ack Next > Cancel

Found New Hardware Wizard	
	This wizard helps you install software for: HardSID 4U If your hardware came with an installation CD or floppy disk, insert it now. What do you want the wizard to do? Install the software automatically [Recommended] Install from a list or specific location (Advanced] Click Next to continue.
	< <u>B</u> ack <u>N</u> ext > Cancel

The next dialog will ask you if you want your XP to search for the drivers.

Answer: Don't search. I'll choose the driver to install.

Click Next.

The next dialog will try to display a list of compatible drivers.

Answer: Click the Have Disk button. A new dialog pops up. Locate the folder where you extracted the driver files and press Ok.

Found New Hardware Wizard
Please choose your search and installation options.
$\bigcirc$ Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
✓ Search removable media (floppy, CD-ROM)
Include this location in the search:
▼ Browse
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee th the driver you choose will be the best match for your hardware.
< <u>Back</u> Next > Cancel
bund New Hardware Wizard
Select the device driver you want to install for this hardware.
Select the manufacturer and model of your hardware device and then click. Next. If you have a disk that contains the driver you want to install, click Have Disk.
Model
Have Disk
<back next=""> Cancel</back>
Found New Hardware Wizard
Select the device driver you want to install for this hardware.
Select the manufacturer and model of your hardware device and then click Next. If you have a disk that contains the driver you want to install, click Have Disk.
I Show compatible hardware

Now the list contains the HardSID 4U driver.

Click on the driver's name and click Next.

This driver is not digitally signed! Tell me why driver signing is important	HardSID 4U	

The next dialog will warn you that the driver has not been verified by Microsoft.

Answer: Click the Continue Anyway button.

The last dialog tells you that your HardSID 4U is

ready to use.

Click the Finish button.

een	Hardware Installatio	n,		
	The soft HardSID	tware you are installing for this hardware: ) 4U		
		passed Windows Logo testing to verify its compatibility ndows XP. [Tell me why this testing is important.]		
	or dest either i recomr contac	Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.		
		Continue Anyway		
Found New	/ Hardware Wizard			
		Completing the Found New Hardware Wizard The wizard has finished installing the software for: HardSID 4U		
		Click Finish to close the wizard.		
		< Back Finish Cancel		

#### Installing the HardSID 4U 32bit or 64bit device driver on Windows Vista

#### Prerequisites for Windows Vista x64 Edition

Windows Vista x64 Edition doesn't allow to load unsigned drivers by default. You have enable unsigned driver installation before trying to install the HardSID 4U drivers on Vista x64.

- Download and install EasyBCD (it's free) from <a href="http://neosmart.net/">http://neosmart.net/</a>
- Go to Advanced options, select your Vista x64 installation and make sure that "Allow unsigned driver installation on Vista 64-bit Edition" is checked/enabled.
- Click the Apply Settings button
- Reboot into Vista x64

Now your Vista x64 will let you to install the HardSID 4U x64 drivers.

× - Found New Hardware The very first dialog on Windows Vista will ask you what Windows needs to install driver software for your HardSID to do with the new hardware: 4U Answer: Locate and install driver software Locate and install driver software (recommended) Windows will guide you through the process of installing driver softwa for your device. ✤ Ask me again later Windows will ask again the next time you plug in your device or log on. 🖲 Don't show this message again for this device Your device will not function until you install driver software. Cancel × The next dialog will ask you if you want your Vista 🕞 🧵 Found New Hardware - HardSID 4U to search for driver online: Allow Windows to search online for driver software for your HardSID 4U? Answer: Don't search online Yes, <u>a</u>lways search online (recommended) Windows will automatically search for the latest drivers and applications for your hardware and download them to your computer. Yes, search online this time only Windows will search for the latest drivers and applications for this device and download them to your computer. Don't search online Your device may not function properly until you get the latest software. Please read Microsoft's privacy statement Cancel X The next dialog will ask you if you have a driver G I Found New Hardware - HardSID 4U disc. Insert the disc that came with your HardSID 4U If you have the disc that came with your device, insert it now. Windows will automatically search the disc for driver software. Answer: I don't have a disc. Show me other options.

✤ I don't have the disc. Show me other options.

Cancel

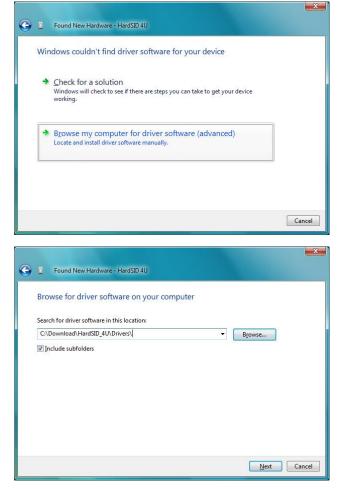
The next dialog will ask you if you want your Vista to find out a solution for you:

Answer: Browse my computer for driver software

The next dialog will ask you for the path to the driver files:

Answer: Browse the folder where you extracted the driver files.

Click Next.



The next dialog will warn you that Windows can't verify the publisher of this driver:

Answer: Install this driver software anyway

 Don't install this driver software You should check your manufacturer's website for updated driver software for your device.
Install this driver software anyway Only install driver software obtained from your manufacturer's website or disc. Unsigned software from other sources may harm your computer or steal information.
See getails

Windows can't verify the publisher of this driver software

Windows Security

The last dialog will tell you that your HardSID 4U is ready to use.



# APPENDIX

## Installing SID Chips video tutorial

The following video tutorial will show you how and where to:

- insert SID chips carefully
- insert / remove filter capacitors
- set the voltage for the SIDs
- handle / connect cables

The purpose of this tutorial is to help you to learn the proper way of handling SIDs, filter capacitors, voltage jumpers and cables in general.

The actual configuration process will be different for you, as you'll probably install different SID versions into the sockets.

About the tutorial:

The initial state of the HardSID 4U unit shown in the tutorial is the same as the initial configuration of your own unit (you've received it with the factory default configuration). Factory default for HardSID 4U units without SID: Sockets 1/3 are configured for 6581 and sockets 2/4 are configured to 8580.

In this tutorial we want to install one 6581 into socket 1 and three 8580 chips into sockets 2/3/4. Since Socket 1 was already configured for 6581 and sockets 2/4 were already configured for 8580 chips as factory default, we don't have to touch the filter capacitors and voltage jumpers for those sockets.

Since Socket 3 was configured for 6581 as factory default, we'll have to replace the 6581 filter capacitors with 8580 filter capacitors. We'll also have to set the voltage jumper for Socket 3 accordingly to 8580 position.

Now that you know what to watch for in the video tutorial, check it out on YouTube:

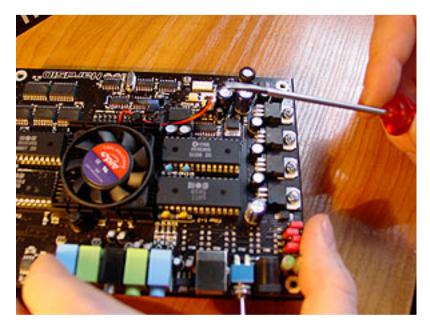
http://www.youtube.com/watch?v=A-7B9HPj1jc

### How to remove SIDs carefully

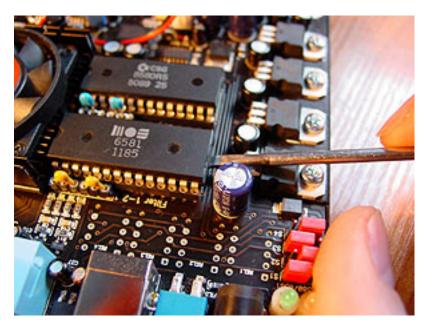
This tutorial shows you how to remove SIDs carefully.

Step 1: Take a flat tip screwdriver

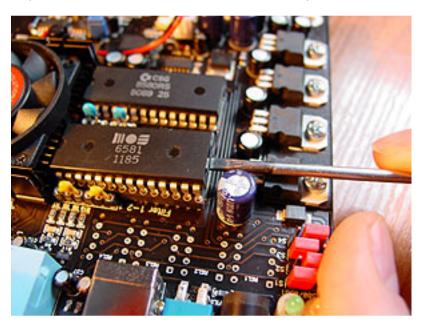
You can see the approximate size of the screwdriver on this picture:



Step 2: Insert the tip of the screwdriver between the SID chip and the SID socket as shown on the picture. Don't push it further under the SID yet. Insert just the edge of the screwdriver's tip.

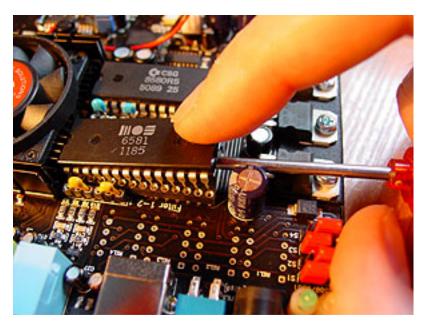


Step 3: Lift the SID a little bit, so the screwdriver's position will be almost horizontal.



Step 4: Push the screwdriver further between the SID and the socket.

Now that you have some place under the SID, you can push the screwdriver until almost the other end of the SID. The SID lifts a bit more so its pins are released from the socket at your end. The screwdriver's position is still horizontal.



Step 5: Start pushing down the handle of the screwdriver carefully to lift the other end of the SID. Lift it until the SID gets horizontal. Now all pins of the SID are released from the socket.



Step 6: You can now take out the SID.

