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July 2002

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Note: To avoid damage of your speakers, always turn down the volume, or turn off the power of your amplifier / active speakers connected to the ST Audio DSP24 MEDIA 7.1 when you are rebooting or shutting down your PC.

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I. Introduction

Congratulations on your purchase of the DSP24 MEDIA 7.1 by ST Audio. The DSP24 MEDIA 7.1 is a PCI interface card with external breakout box that turns your PC into a high quality 24bit/96kHz audio system that can be used for professional multichannel recording, audio editing, audio playback and much more. The unique combination of features allows the usage of the MEDIA 7.1 hardware in both professional and home environments. With extensive experience in the audio and PC industry, combined with valuable suggestions from our customers, our engineers have developed a product we know you will be satisfied with. We guarantee you uncompromising quality, as well as excellent technical and audio properties at an extremely affordable price.

What's in the box?

You should have received the following with your DSP24 MEDIA 7.1 card:

- ST Audio DSP24 MEDIA 7.1 PCI audiocard
- 9.5" external breakoutbox with audio I/O connectors
- 25pin D-SUB connection cable to connect the PCI card with the external breakout box
- 1/8" analog audio connection cable to connect the PCI card with the external breakout box
- internal 4pin/3pin analog audio cable
- ST Audio / Hoontech driver and installation CD-ROM (contains bundled software / drivers)
- Logic SoundTrack24 CD-ROM by Emagic
- This manual

Functions

The MEDIA 7.1 card from ST Audio is easy to install and contains everything you need to build a powerful audio system with your PC. This is achieved by the integration of all major functions common to modern consumer soundcards into the featureset of our professional audio recording hardware. With the analog and digital connectors of the external breakout box and the bundled software, the MEDIA 7.1 hardware is the perfect solution for a large number of applications. Before the release of the MEDIA 7.1 it was not possible for one single product to have such a wide range of possible applications with similar high end audio quality:

- **audio recording and editing:** record audio data from analog sources such as CD, Vinyl, Tape, etc. or digital sources such as MD, DCC, DAT, etc. to your PC. The MEDIA 7.1 hardware allows you to connect a turntable directly without the need of an additional phono-preamp. The hardware also contains optical and coaxial S/PDIF digital inputs next to a

high quality analog microphone input with switchable phantom power. Note that the MEDIA 7.1 supports real 24bit/96kHz audio quality for both recording and playback.

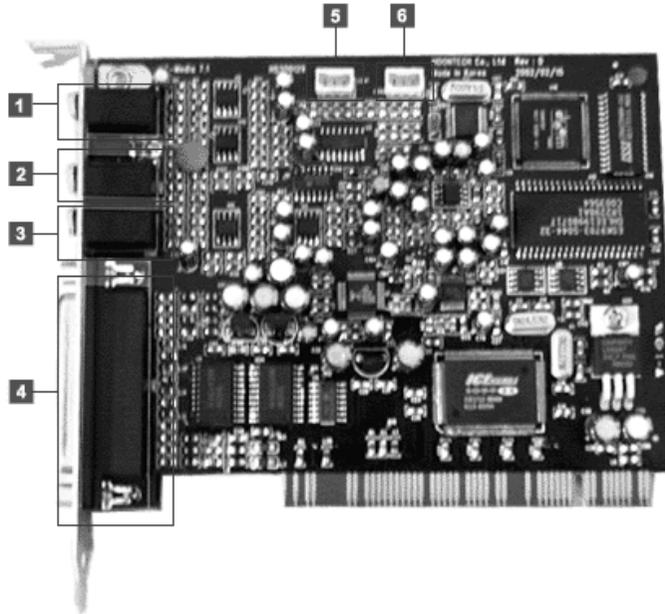
- **audio restoration:** the MEDIA 7.1 hardware is bundled with the special audio restoration software DCart32 V4 that contains over 20 realtime noise reduction and audio enhancement tools to remove clicks, pops, hiss, surface noise, hums, buzz and much more. Combined with the analog phono input of the hardware, this allows you for example to record and restore old vinyls to audio CDs with enhanced audio quality.
- **multichannel playback:** with the 8 independand analog output channels and the additional stereo S/PDIF output (optical and coaxial), the MEDIA 7.1 hardware can be used perfectly for multichannel 5.1 or 7.1 signal playback from DVDs or for your own surround productions. As all outputs can be accessed independantly from a single audio application or from several programs at the same time, the possibilites are huge. One possibility would be for example to use special DJ-software that accesses the separate outputs independantly simultaneously.
- **playback of GM/GS MIDI data:** the MEDIA 7.1 hardware also contains a high quality hardware synthesizer to playback GM/GS MIDI files in a very high quality. No PC memory is used for the synthesizer and no CPU load is generated compared to other solutions. With the additional MIDI interface (16 input channels, 16 output channels) the MEDIA 7.1 can be connected to other MIDI equipment such as controller keyboards or additional synthesizers.
- **integration of consumer soundcard functions:** the MEDIA 7.1 hardware also contains a special AC-97 codec that provides the functions of a normal consumer soundcard. This allows you to connect two internal audio devices such as CD-ROM drives or TV-cards to the card. Additionally there is a line input that provides the connection possibility for an onboard or secondary soundcard if you want to use it simultaneously with the MEDIA 7.1.
- **professional harddisc recording and music production:** the MEDIA 7.1 hardware is shipped with a driver that supports all major standards (WDM, ASIO 2.0, GSIF, ...) in the world of professional audio recording and editing. This means that the card easily integrates in all famous audio applications used for music production.
- ... and much much more!

About this manual

The DSP24 MEDIA 7.1 is a unique new audiocard that combines a number of functions from professional recording hardware with the functions of normal soundcards with the focus on high audio quality. The hardware can be used in a very wide range of different applications. Because of that, you need to setup your audio software and your PC specifically for each of your audio applications. This manual contains detailed information about all the functions of the hardware and the control panel software. It also contains details about setting up certain audio applications for the DSP24 MEDIA 7.1 and it continues with optimization and troubleshooting information. Because of that, we strongly recommend to read this manual completely before you start using your DSP24 MEDIA 7.1.

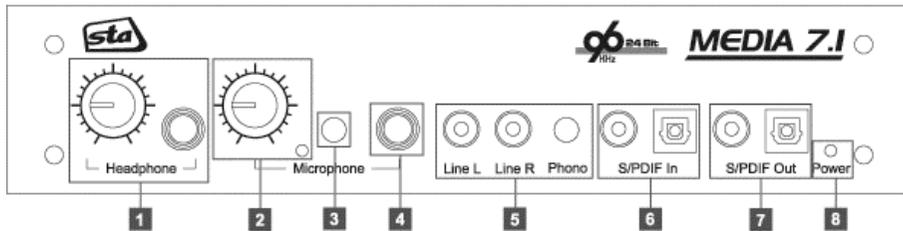
II. In- and output connectors

PCI card



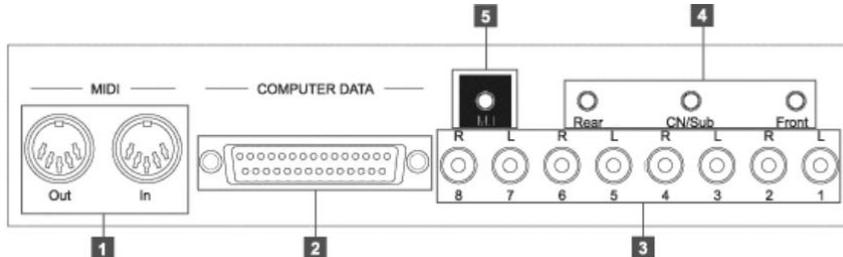
1. microphone input (e.g. to connect third party headsets)
2. 1/8" line input (routed to *Internal Mixer*) to connect a second (or onboard) soundcard or a TV-card with external output to the DSP24 MEDIA 7.1
3. M.O. (mix out) – connector to connect the PCI-card with the external box using a 1/8" cable
4. 25pin D-SUB connector to connect the the PCI-card with the external box using a D-SUB cable
5. analog CD input (routed to *Internal Mixer*)
6. analog Aux input (routed to *Internal Mixer*)

External Box - front



1. headphone output with adjustable gain (1/4" output)
2. gain knob for the microphone input with peak LED
3. +48V phantom power switch for high quality microphones (On/Pushed: phantom power on, Out: phantom power off)
4. balanced microphone input (1/4" TRS)
5. RCA stereo line input (-10dBv), switchable to phono (RIAA EQ) to allow direct connection of a turntable (Out: line input works as phono input, On/Pushed: line input works for line signals)
6. optical (TOSLink) and coaxial (RCA) S/PDIF input
7. optical (TOSLink) and coaxial (RCA) S/PDIF output
8. power LED

External Box - back



1. MPU401 MIDI in/out port
2. 25pin D-SUB connector to connect the external box to the PCI-card using a D-SUB cable
3. 8 RCA line outputs (4 times stereo) for channel 1~8 (incl. the main outputs 1/2)
4. 3 stereo 1/8" minijack outputs for channel 1~6 (incl. the main output Front)
5. M.I. (mix in) – connector to connect the external box with the PCI-card using a 1/8" cable

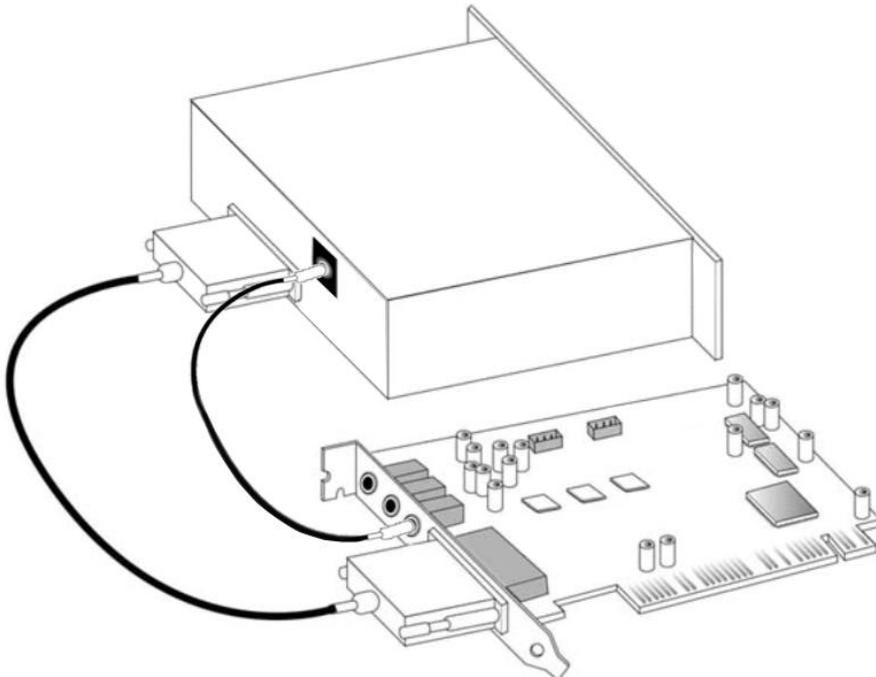
III. Hardware installation / connection

Make sure the computer is switched off and unplugged. Remove the external computer cover. Insert the DSP24 MEDIA 7.1 card into a free PCI slot making sure that it is pressed firmly into position and secure it to the computer case.

The analog output of your CD-ROM drive should now be connected to the internal CD input with the included analog audio cable.

The DSP24 MEDIA 7.1 card system consists of the main PCI card and the external 9,5" breakout box. This external box is connected to the DSP24 MEDIA 7.1 host card by using the thick cream colored 25-pin cable included with your system. To connect the external box please follow these directions:

Connect the long cream 25-pin lead from the 25-pin connector on the rear of the DSP24 MEDIA 7.1 PCI card to the COMPUTER DATA connector of the external box. Also connect the 1/8" <-> 1/8" cable between the M.O. connector on the DSP24 MEDIA 7.1 and the M.I. connector on the back of the external box.



Caution: never connect or disconnect the 25-pin data-cable when the computer is turned on. Always shut down your system before the cable is removed. Please also note that the MEDIA 7.1 card will not work properly unless the external box is connected to the PCI-card.

Once the hardware is properly installed, you will have two cables running between the external box and the DSP24 MEDIA 7.1 PCI-card. After everything is connected to the card, you can re-assemble your PC and later continue with the driver and software installation.

The available in- and out- connectors have been described in the previous chapter already. After the hardware has been installed into the PC, you can now connect all the inputs and outputs to your other music gear.

The main outputs on the back of the external box are designed for the use with a suitable (surround) amplifier or a special active speaker system. The outputs are on normal line level so a mixer can also be connected in studio environments. Channels 1 to 6 are available both in RCA format (typically used for HiFi-equipment, e.g. for 5.1 HiFi amplifier systems) and as 1/8" stereo minijacks (typically used for active PC speaker systems). Please connect your Front, Rear and Center/Woofer speaker channels to the corresponding outputs. If you just use a stereo pair of active speakers, connect them (or your amplifier) to the Front output (channel 1/2). Note that the output channels 7 and 8 only exist in RCA format.

If you use a digital amplifier, connect it to the coaxial or to the optical S/PDIF output on the front of the external box.

If you use another soundcard inside your PC (e.g. the onboard soundcard of your mainboard) or a TV-card that has an external audio output, you can connect it with a short cable to the 1/8" Line Input on the PCI-card itself. This allows you to listen to all the signals from your second soundcard or the TV-card through the DSP24 MEDIA 7.1 *Internal Mixer* and through the amplifier / speakers connected to the external box of the MEDIA 7.1 hardware.

IV. Driver and software installation

The DSP24 MEDIA 7.1 comes with a CD-ROM that contains WDM drivers for Windows 2000/XP and drivers for Windows 9x/Me. You can also download the latest drivers from our website at www.STAUDIO.com. Please note that the installation process is different, depending on the version of Windows you are using.

Installation under Windows XP

The following instructions refer to Windows XP. If you use Windows XP Professional, you must be logged in as Administrator or with similar rights in order to install the DSP24 MEDIA 7.1 driver.

After the installation of the PCI-card in the computer, boot up the system. Windows will detect the new hardware **automatically** a few seconds after you have entered your password and display the following screen.



Select *Install from a list or a specific location (Advanced)* and click *Next*.



On this dialog (displayed on the previous page), select *Search for the best driver in these locations* and make sure *Include this location in the search:* is checked. Type in <drivename>:\media\wdm (where <drivename> equals the letter of your CD-ROM drive) in the text box below above and click *Next*. Alternatively, you can click *Browse* and select the correct directory on the CD, then click *Next*.

If you get a dialog box about a missing driver signature, you can ignore it and just select *Continue installation*.

The driver files are now copied to your system. Once the installation is completed, the following dialog will be displayed:



Click *Finish*.

After the driver is installed ensure the installation worked by selecting *Start > Control Panel > System > Hardware > Device Manager > Sound, video and game controllers* (you might have to switch your Windows XP *Control Panel* to *Classic View* to get to the *System* applet directly). You should see the audiocard's device listed there. Highlight it and click on *Properties*. You should see the message *This device is working properly*. If so, congratulations are in order. You have successfully installed the drivers for the DSP24 MEDIA 7.1 under Windows XP.

Installation under Windows 2000

The following instructions refer to Windows 2000. Please note that you must be logged in as Administrator or with similar rights in order to install the DSP24 MEDIA 7.1 driver under Windows 2000.

After installation of the DSP24 MEDIA 7.1 in a PCI slot in the computer, boot up the system. Windows will detect the new hardware **automatically** a few seconds after you have entered your password and display the following screen.



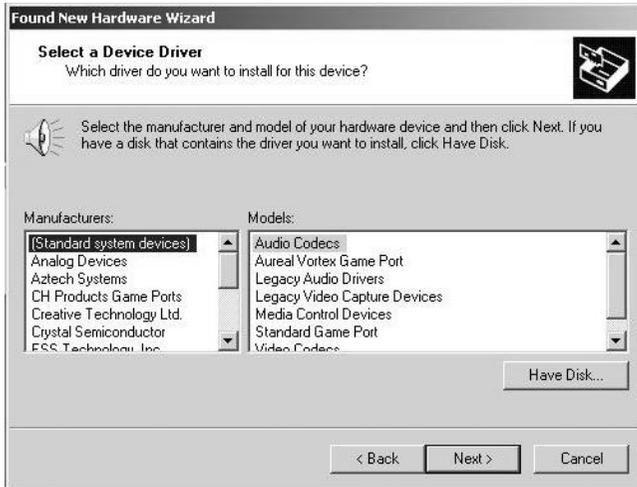
Click *Next*.



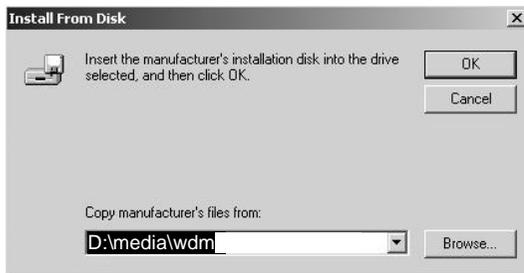
ST AUDIO DSP24 MEDIA 7.1

Select *Display a list of the known drivers for this device so that I can choose a specific driver* (very important!) and click *Next*.

Select *Sound, video and game controllers* on the next dialog and again click *Next*.

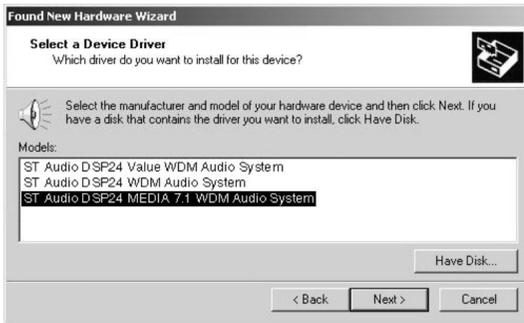


Select *Have Disk...*



Type in `<drivename>:\media\wdm` (where `<drivename>` equals the letter of your CD-ROM drive) in the window displayed above and click *OK*. Alternatively, you can click *Browse* and select the correct directory on the CD, then click *OK*.

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On this dialog (displayed on the previous page), make sure to select *ST Audio DSP24 MEDIA 7.1 WDM Audio System*. Do not select any of the other entries (very important!). Click *Next*. If you get a dialog box about a missing driver signature, you can ignore it and just select *Continue*.



The next dialog is displayed to confirm the correct selection. Click *Next*. The driver files are now copied to your system.

At the next window, complete the installation by clicking *Finish*. On some systems you will be prompted to reboot the system. If that is the case on your PC, click *Yes*.

After the driver is installed, ensure the installation worked by selecting *Start > Settings > Control Panel > System > Hardware > Device Manager > Sound, video and game controllers*. You should see the audiocard's device listed there. Highlight it and click on *Properties*. You should see the message *This device is working properly*. If so, congratulations are in order. You have successfully installed the drivers for the DSP24 MEDIA 7.1 under Windows 2000.

Installation under Windows 9x/Me

The following instructions refer to Windows 98 / 98 SE. The installation under Windows 95 and Windows Me is very similar, although the displayed dialog boxes might look slightly different.

After the installation of the DSP24 MEDIA 7.1 in a PCI slot in the computer, boot up the system. Windows will detect the new hardware **automatically** and display the following screen.



Click *Next*.



Select *Search for the best driver for your device* and click *Next*.



Check *Specify a location*. Do not check *CD-ROM drive* or *Floppy disk drives*. Type in <drivename>:\media\win9x (where <drivename> equals the letter of your CD-ROM drive) in the window displayed above and click *Next*. Alternatively, you can click *Browse* and select the correct directory on the CD, then click *Next*.

Note: make sure that you do not use drivers from any other directory, even if Windows might offer them to you.



After Windows finds the driver you should see the above screen naming the driver information file indicated in the screenshot. Click *Next*.



At this window, complete the installation by clicking *Finish*. Windows will now install the driver for you through a series of installation screens. If you are prompted to do anything (this would be unusual), please follow the directions on screen.

The *Output Mixer* software will be loaded automatically now. Check the OUTPUT MIXER chapter (V) for reference.

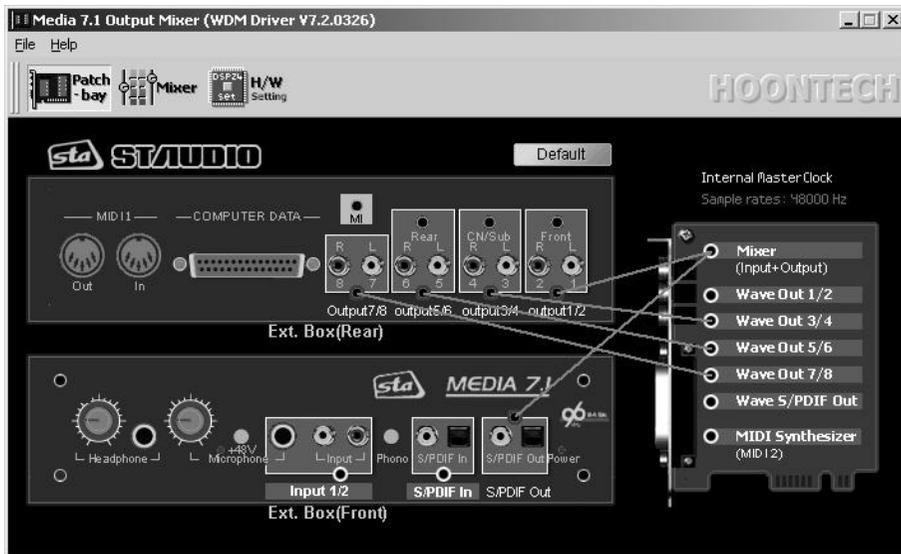
After the driver is installed ensure the installation worked by selecting *Start > Settings > Control Panel > System > Device Manager > Sound, video and game controllers*. You should see the audiocard's device listed there. Highlight it and click on *Properties*. You should see the message *This device is working properly*. Click on the Resources tab, you should see the message *No conflicts*. If so, congratulations are in order. You have successfully installed the drivers for the DSP24 MEDIA 7.1 under Windows 9x/Me.

V. Output Mixer

The *Output Mixer* control panel software is the main control center of the DSP24 MEDIA 7.1 hardware. The software is used to control the monitoring and the signal levels of your audio PC. Different applications and environments (e.g. audio recording vs. multichannel playback) require different monitoring setups. Sometimes you want to listen to the signal you are recording directly (hardware monitoring). Sometimes you want to listen to a modified version of the signal (e.g. processed by an effect processor) or you want to listen to the sounds of the hardware MIDI synthesizer on the MEDIA 7.1 hardware. This means that you need to be able to define what exactly is played through each separate output channel of the hardware. The *Output Mixer* control panel software allows you to do that; choose the way you like to work.

Patchbay

The main screen (Patchbay) of the software shows the connectors on the external box of the MEDIA 7.1 on screen (both the front and rear panels are displayed). The right section of the Patchbay screen symbolizes the I/O interface as addition to the external box.



The software allows you to connect the available playback sources (light green background) with the physical outputs (light blue background) virtually on screen.

ST AUDIO DSP24 MEDIA 7.1

The virtual cables for the outputs cannot be removed but replaced by other connections. These connections are displayed as straight lines between the red and white circles. The available output sources (white circles / light green background) are:

- *Mixer*; the output signal from the digital mixer on the MEDIA 7.1 hardware (see below)
- *Wave Out 1 / 2*; the playback of the wave device *ADSP24 Ext. 1/2 Audio Device* or channel 1/2 of the ASIO/GSIF driver
- *Wave Out 3 / 4*; the playback of the wave device *ADSP24 Ext. 3/4 Audio Device* or channel 3/4 of the ASIO/GSIF driver
- *Wave Out 5 / 6*; the playback of the wave device *ADSP24 Ext. 5/6 Audio Device* or channel 5/6 of the ASIO/GSIF driver
- *Wave Out 7 / 8*; the playback of the wave device *ADSP24 Ext. 7/8 Audio Device* or channel 7/8 of the ASIO/GSIF driver
- *Wave S/PDIF Out*; the playback of the wave device *ADSP24 Ext. SPDIF Device* or channel 9/10 of the ASIO/GSIF driver
- *MIDI Synthesizer*; the output of the hardware MIDI synthesizer on the DSP24 MEDIA 7.1 (accessed by the MIDI device *ADSP24 MIDI2 Device*)
- *Input 1/2*; the input signal from the line, phono or microphone input on the external box
- *S/PDIF In*; the input signal of the optical or coaxial S/PDIF input on the front panel of the external box

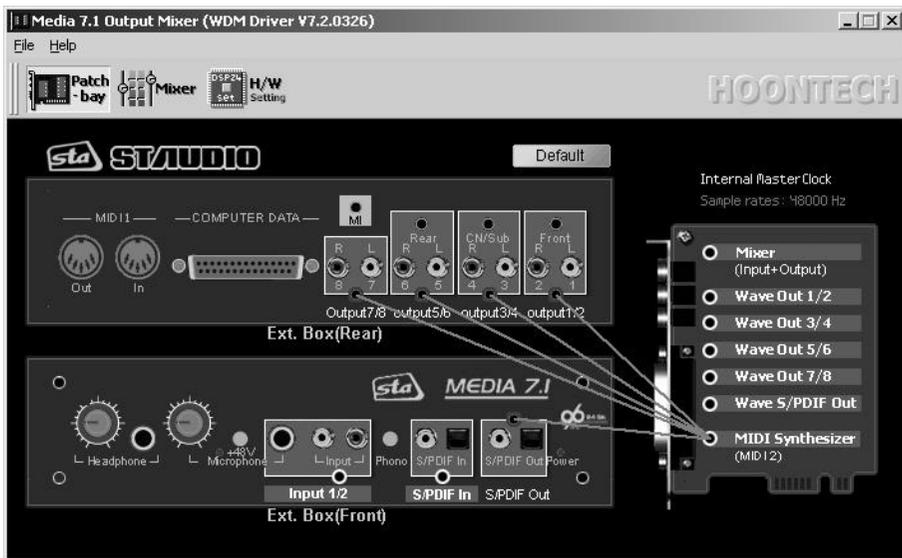


All of these available signal sources can be connected to the outputs (red circles / light blue background) in the *Patchbay* window. Just click and hold the left mouse button on the white circle of the signal source and release it on the red circle of the output destination you want to send the signal to. The *Output Mixer* control panel software will show you which destinations can be reached by the selected signal by changing the color of the possible destinations until the left mouse button is released.

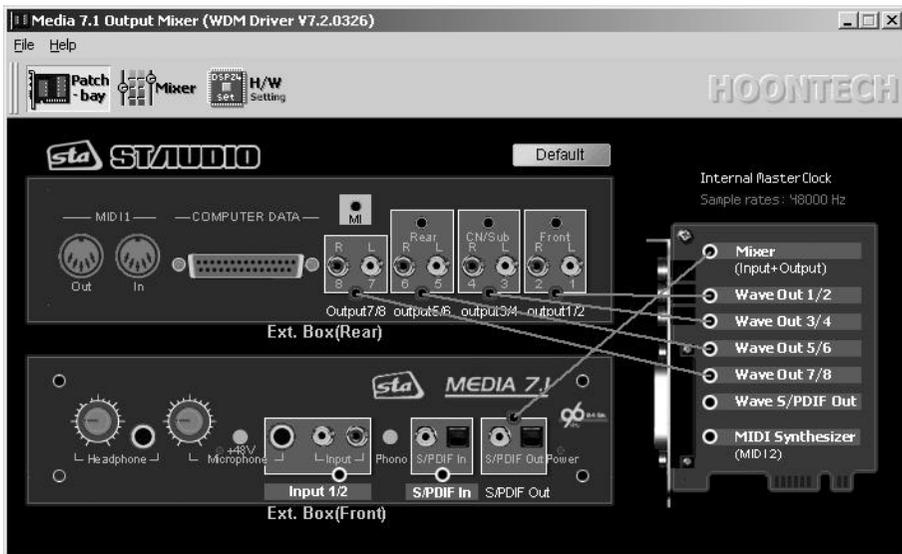
Examples

The following pages contain a few examples of possible *Patchbay* configurations for certain situations:

ST AUDIO DSP24 MEDIA 7.1

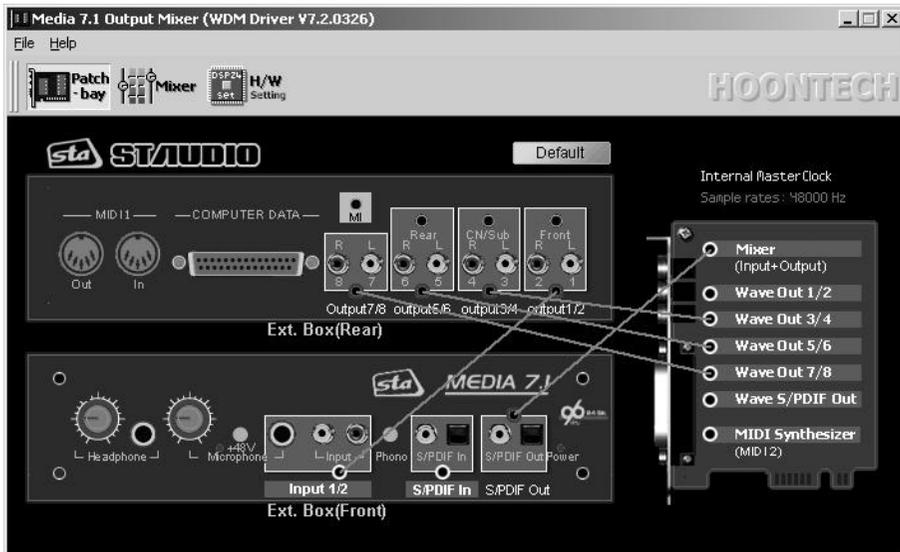


This setup (above) routes the output signal of the MEDIA 7.1 hardware synthesizer to all analog output channels and to the S/PDIF output simultaneously.



The configuration on this picture is used to send out the signal of the digital mixer to the optical and coaxial S/PDIF output. At the same time, all wave out device channels are sent directly to their corresponding physical outputs (e.g. for analog 6 or 8ch DVD playback).

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The setup on this picture also has a connection between the digital mixer and the S/PDIF output. Additionally it is used to send out the signal from the physical analog input 1/2 to output 1/2 (no latency / realtime) to allow direct monitoring of the incoming signal.

Digital Mixer

With the *Mixer* section inside the *Output Mixer* software you can control all incoming and outgoing signals. Open it by clicking on *Call Mixer* in the menu of *Output Mixer* or by clicking the *Mixer* button.



Note: The digital *Mixer* will only change the audible signal for monitoring purposes. You can either output it through the analog output 1/2 and/or through the S/PDIF outputs on the external box (as connected in the *Patchbay*). When you are recording an input signal, the digital *Mixer* does not change the signal level. This ensures that you are always recording with best possible audio quality without reduction of the dynamic range. All professional cards operate in this way.

Master



Controls the output volume of the digital *Mixer*. The signal controlled here will be played through the analog output 1/2 and/or through the S/PDIF output. It is even possible to resample the output signal of the digital *Mixer* internally using the wave device *ADSP24 Digital Mixer (n)* or channel 11/12 of the ASIO driver.

You can control the the volume of the left and right channels independantly. Muting the signal is possible as well.

Wave (1/2 to 7/8)



In the *Wave* section you can control the volume of the playback signal (for the devices *ADSP24 Ext. x/x Audio Device* or the channels 1~8 of the ASIO and GSIF driver).

Muting each channel is possible (*M* button). Also you can control the panning independant for the left and right channel of each stereo device.

S/PDIF Out



In the *S/PDIF Out* section you can control the volume of the signal of the device *ADSP24 Ext. SPDIF Device* or channel 9/10 of the ASIO and GSIF driver.

Muting the left and right channels is possible independantly.

S/PDIF In



This section controls the signal from the digital S/PDIF input of the card.

Muting the left and right channels is possible independantly.

Input 1/2



This sections controls the volume of the analog input channel (line, phono, microphone).

Muting the left and right channels is possible independantly.

MIDI Synthesizer



This sections controls the volume of the hardware MIDI Synthesizer that is accessed by the *ADSP24 MIDI2 Device* MIDI device.

Muting the left and right channels is possible independantly.

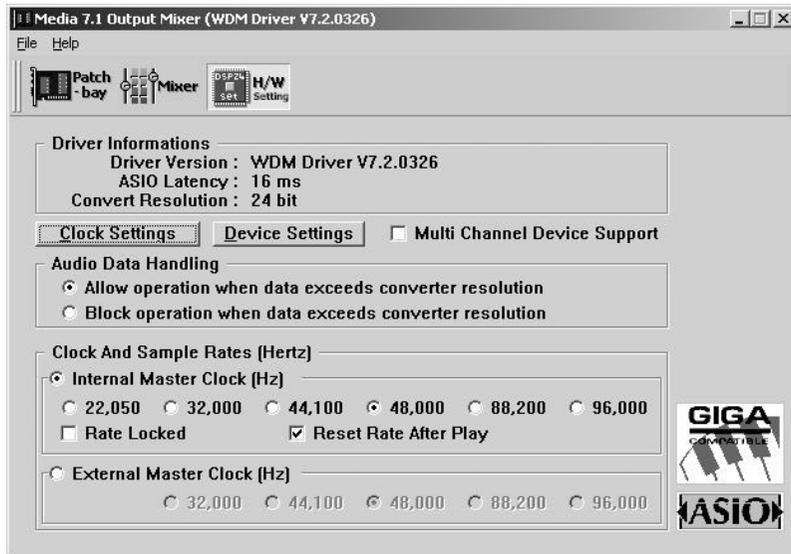
Presets

The digital *Mixer* allows you to save four presets for quick access. You can easily load them by clicking on the *1*, *2*, *3* or *4* button. To save the current settings under the selected number, simply press *Save*.



Hardware Settings

The *H/W Setting* dialog of the DSP24 MEDIA 7.1 is used to control the basic driver settings of the audiocard. You call it via the *Output Mixer* control panel software (*H/W Setting* button or via the menu). The *H/W Setting* dialog is also used when you open the ASIO control panel from an ASIO compatible sequencer such as Emagic Logic Audio or Steinberg Cubase VST.



The upper section displays the current version of the driver that is installed. Also you can see the current latency that has been selected for the ASIO 2.0 driver. Below that, you can see the resolution of the converters that are used in your hardware setup. This will be always *24-bit* on the DSP24 MEDIA 7.1 as the ADC/DAC used on the card works with 24bit resolution.

Clock Settings

The *Clock Settings* tab, controls the samplerate of the card.

Under *Audio Data Handling* you can determine if the card allows you to playback and record with a bit-depth that is higher than the converter resolution (displayed above). As the converter resolution on the DSP24 MEDIA 7.1 is 24bit, it does not matter in most situations what is selected here. The default setting is *Allow operation when data exceeds converter resolution*.

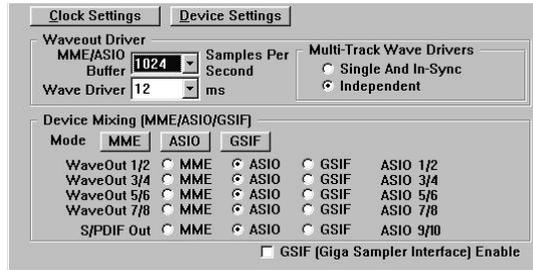
The *Clock And Sample Rates (Hertz)* section allows you to select the source of the clock for the DSP24 card. You can select between *Internal Master Clock* and *External Master Clock*. Make sure to select *External Master Clock* **only** if you are recording or monitoring from the S/PDIF input of the card (optical or coaxial). In that case, the device that is connected to the input will supply the clock for all operations you perform with the card. If you select *Internal Master Clock* (default), the clock generator on the card will generate the samplerate. You will have problems with noise and clicks in your audio signal if you have selected external clock without an active device (DAT, MD, digital mixer, etc.) on the digital input. Also you will have similar problems when you want to record a signal from the digital input with the card set to internal clock.

The section of the *H/W Settings* dialog also shows the current sample rate of the card, which has been set by your application software. The samplerate selected here will be used for all functions of the card. This includes the digital output, so if you sync an external device (MD, DAT, digital mixer, etc.) to the DSP24 MEDIA 7.1, it will use the clock that is selected here. The *Rate Locked* option is used to force the card to a specific samplerate. It is disabled by default (which is also our recommendation) which automatically allows your application software access to all supported samplerates. When the option is enabled, your software will only work with the selected sample rate. This means that any application that attempts to use the driver at a different sample rate will show an error message. *Reset Rate After Play* should be selected when you want the sample rate to return to a specific setting after software has finished using the card for playback and/or recording. This is especially important if your external device that is connected to the digital output of the card, is synced to the DSP24 card. If you just use the analog outputs, the selected samplerate and the *Reset Rate After Play* option are not important when the card is not used by your software at the moment.

Device Settings

The *Device Settings* tab controls the options needed for playback and recording.

Under *Waveout Driver* you can select the *MME/ASIO* buffer size (latency). The smaller the selected value is, the smaller the resulting latency of the ASIO driver will be (and the other way round). You might notice the latency when you perform some action inside your ASIO application (e.g. you are using a VST instrument in Cubase VST): the result of your action will be audible with a certain delay - the latency.



You have to keep in mind that a smaller latency also increases the PC utilization, and might have some influence on the performance (very much depending on the PC configuration). A buffer size that is too small may result in clicks or drop outs in the audio signal. Larger buffers could prevent this. This buffer size should be set in the dialog box **before** you launch your music software. In some ASIO applications it is important to re-launch the software even if you have changed the buffer size via the ASIO control panel inside the application. We strongly recommend this for Logic SoundTrack24 and other versions of Logic Audio from Emagic for example but it is also recommended for all other ASIO applications.

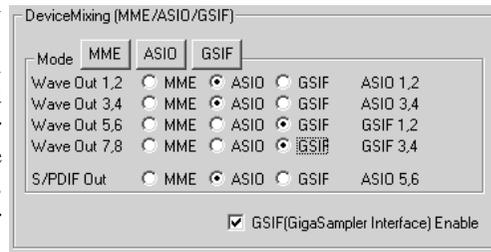
The *WaveDriver* setting under the *MME/ASIO buffer* allows you to change the latency of the MME driver in ms for Windows 2000/XP (this setting is not needed under Windows 9x/Me).

The MME drivers of the DSP24 card automatically synchronize the beginning of recording and playback for all audio devices. For some software applications that are using several MME

devices simultaneously, you should select *Single and In-Sync* under *MultiTrack Wave Drivers* to ensure that all channels will begin playback and/or recording at exactly the same time. Otherwise select *Independent* - this allows you to use the cards MME devices with more than one application at the same time.

Multiclient Support (Device Mixing)

The *DeviceMixing (MME / ASIO / GSIF)* section allows you to assign individual stereo output pairs to a certain driver model to be able to use several different programs (e.g. GigaSampler- / Studio and a Audio- / MIDI- Sequencer like Logic Audio or Cubase VST) at the same time. If these settings are not available in your setup, GigaSampler-/Studio is not supported with the driver you have installed or are not supported under the operating system you are using.



Multiclient support is available for MME drivers (e.g. usually used by WaveLab, Sound Forge, Cool Edit, Cakewalk, ...), the ASIO driver (e.g. used by Logic, Cubase VST, Reaktor, ...) and the GSIF driver (used by GigaSampler and GigaStudio). This even allows you to use GSIF software that was designed to run separately on a system without other software parallel to other audio programs.

The example on the picture above shows a setup where the output channels 1~4 and the S/PDIF output channels are assigned to the ASIO driver. Channels 5~8 are assigned to GSIF. This setup is done **before** you start GigaSampler-/Studio and your ASIO application. It is not possible to change *DeviceMixing* settings after you have launched your audio application(s).

The last column of the section displays the resulting channel numbers. In this example, the S/PDIF output channel (which is usually 9,10) has been assigned to channel 5,6 of the ASIO driver. Also, the channels 5~8 are assigned to channels 1~4 of the GSIF driver. This assignment is needed, because the DSP24 driver simulates a normal audiocard interface in the different driver models for the applications. This prevents compatibility issues with certain audio applications.

It is not recommended to change this setup often, as the different applications will also save the channel assignments internally. If you change the settings in the *DeviceMixing* section, it is wise to double-check the soundcard setup inside the audio apps you are using after that. These options have been invented because of the demand from the users to be able to use GigaSampler/Studio simultaneously to famous Audio-/MIDI-Sequencer software. We strongly recommend to use at least v1.64 of GigaSampler or v2.2 of GigaStudio in order to use the multiclient support. The performance may not be as good when using earlier versions of the software. GigaStudio 2.2 and

above will give you best performance. For Windows 2000/XP, you need at least version 2.5 of GigaStudio. GigaSampler is not supported under Windows 2000/XP.

Etc. section



Under the *Etc.* tab, the option *Multi Channel Device Support* allows you to playback audio signals on multiple audio channels simultaneously over one wave device (a possibility that is used by DVD player applications such as WinDVD or PowerDVD for example). Unless you are using a software that plays multiple audio channels via one MME audio device, you don't need to

enable this option. The chapter USAGE WITH SOFTWARE APPLICATIONS contains more information.

Below that, the *S/PDIF Out (AC-3)* setting allows you to switch the digital output of the MEDIA 7.1 hardware to *Consumer Mode* or *Non-Audio* mode. Depending on the requirements of the device you have connected to the digital output, you might have to change this setting to transfer S/PDIF PCM (or AC-3) signals.

Internal Mixer

Clicking on *Call Internal Mixer* in the *File* menu inside the *Output Mixer* control panel will launch the Windows Mixer (SNDVOL32.EXE) to control the *Internal Mixer* section of the card.

The *Internal Mixer* on the DSP24 MEDIA 7.1 represents basically an additional soundcard which has been 'added' to the audiocard functions. You can use this section to play Windows sounds, or the metronome from a sequencer. You can also use it for consumer applications such as games, or for internet phone usage. Since the *Internal Mixer* even supports DirectSound, you can use it also for some conventional software synthesizer applications. The Windows Mixer is used to control these functions. These functions are represented by an AC-97 codec chip that is on your DSP24 MEDIA 7.1 card. AC-97 has been defined as standard by Intel for consumer audio applications on modern PCs. The AC-97 codec ST Audio is using works with a 18bit ADC, a 18bit DAC and an analog mixer. The output of the *Internal Mixer* is connected via the M.I<->M.O. cable (check the HARDWARE INSTALLATION chapter for reference) to the main section of the card and then audible via Output 1/2 of the external box.

Note: The *Internal Mixer* output signal is **not** audible via the headphone output of the external box.

Practically you would never use the *Internal Mixer* for high quality recording or playback for music creation. However, the *Internal Mixer* is a great feature that allows you to integrate the sound output of a second soundcard (e.g. the onboard soundchip) or of a TV card to name two examples.

The following channels are available:

- Master** Controls the *Master* output volume of the *Internal Mixer*. This signal is sent out via the analog monitoring output.
- Wave** Controls the *Wave* volume. The signal you play via the MME device *ADSP24 Int. WaveOut* (or *ADSP24 Int. Audio Device*) is controlled here. Signals from pro audio applications (using ASIO or GSIF for example) are not controlled by the *Internal Mixer* of course. By default this device is selected as output for Windows system sounds under *Control Panel > Multimedia > Audio > Preferred playback device*.
- Line In** Controls the volume of the 1/8" line input on the PCI-card (usually connected to an onboard soundcard or TV card).
- Mic In** Controls the volume of the microphone input on the PCI-card itself. Use this channel if you are connecting a headset for speech recognition or internet phone applications to the DSP24 MEDIA 7.1 PCI-card. This channel does not control the microphone input on the external box.
- CD In** Controls the volume of the internal analog CD input (3-pin).
- Aux** Controls the volume of the internal analog Aux input (3-pin).

VI. MIDI Synthesizer

The DSP24 MEDIA 7.1 contains a GM/GS compatible MIDI synthesizer. All MIDI data that is played via the *ADSP24 MIDI2 Device* device is sent to the hardware synthesizer on the MEDIA 7.1.

MIDI basics

MIDI means Musical Instrument Digital Interface. It defines the most common interface to send and receive data between musical instruments and the computer. Until the early 80s, nearly all synthesizers have been completely analog. The digital technology was not good enough and relatively expensive. It was often a problem to use multiple instruments simultaneously and synchronized in the studio and on stage. Special analog connections between synthesizers and other devices based on changing voltage have been used to control sound generators remotely. With the availability of the first digital synthesizers and keyboards the need for a universal interface between these devices and other instruments such as drum computers or effect processors became bigger.

Different synthesizer manufacturers then worked together to define MIDI as a common standard that is used until today. The result was that a keyboard (usually so-called master-keyboard) can be connected with its MIDI output to the MIDI input of any other synthesizer. The synth then generates the sounds from the notes that are played on the keyboard. The signals are transferred by the serial MIDI interface as separate commands. Most synthesizers contain a MIDI in and a MIDI out connector to be able to send and receive MIDI data. To connect the devices with each other, 5pin DIN-cables are used.

The MIDI interface is able to transfer all kinds of different data. Information about timing, note values, note length, velocity, etc. are usually transferred. To control several devices simultaneously, MIDI uses 16 independent channels. Every device only responds to commands on its specific channel.

Later, devices became more powerful and one modern synthesizer typically responds to more than just one MIDI channel (that is called multitimbrality). The synthesizer on the DSP24 MEDIA 7.1 responds to all 16 MIDI channels which means that it is 16 times multitimbral.

General MIDI standard

After the MIDI standard was introduced a number of devices from different companies could be connected with each other but it was still quite difficult to control the features of each device because of their different assignments of the various sounds and parameters.

The General MIDI (GM) standard was introduced to overcome these issues. It defines a fixed assignment of 128 instruments and it defines a basic drumkit. The definition for all instruments numbered from 1 to 128 is now standardized (e.g. the Grand Piano has always program number 1). GM also defines that the standard drumkit is played always on MIDI channel 10.

Roland General Synthesizer

The GM definition of 128 instruments and one single drumkit is not very flexible. Because of that, some synthesizer manufacturers extended GM with their own features. Roland created the GS standard that was originally limited to Rolands own synthesizers. The most important feature of GS is its 100% compatibility to GM, still it defines three main changes:

- The number of instruments was increased with the invention of the so-called variation or bank. Up to 128 versions of every signal instrument can be accessed in Roland's GS definition which theoretically creates a limit of $128 \times 128 = 16384$ instruments.
- GS compatible synthesizers usually have several different drum kits (e.g. an electro, classic or analog version as addition to the default GM drum kit).
- Two effect processors have been added: Reverb and Chorus.

The synthesizer of the DSP24 MEDIA 7.1 is compatible to the Roland GS standard and supports all MIDI functions of the original Roland devices. This also means that the synthesizer is fully GM compatible.

Usage in your sequencer software

Most modern sequencer programs by default provide several tracks for MIDI data playback. For every track you can select the MIDI port. In order to playback signals via the DSP24 MEDIA 7.1, you need to select the device *ADSP24 MIDI2 Device*. If you want to send signals to external MIDI equipment (connected to the MIDI out port of the external box), you need to select *ADSP24 MIDI1 Device* instead.

If you want to play several instruments at the same time via the MEDIA 7.1 hardware synthesizer, you should use several MIDI tracks with different MIDI channels.

Emagic Logic Audio

In the different versions of Emagic Logic Audio it is usually best to select the instruments in the track mixer. Logic automatically displays the names of the GM instruments. If you want to change the bank/variation to select a GS sound, you can directly enter the variation number in the *Bank LSB (0)* field. The *Reverb* and *Chorus*

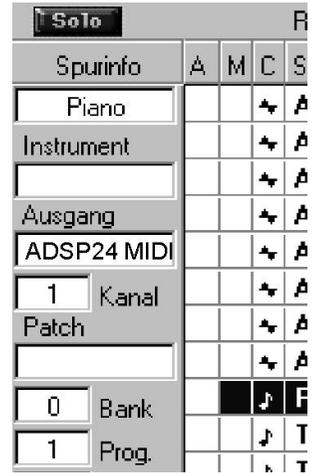


Depth parameters allow you to change the effect settings individually for each track.

The number of the MIDI channel and the MIDI device can be selected directly on the left side of the arrangement window. You can find more details about MIDI in your Logic documentation.

Steinberg Cubase VST

The arrangement window of Cubase VST contains the so-called inspector on the left side. This section allows you to control the parameters of the currently selected track. Under *Output* you can select the output MIDI device (should be *ADSP24 MIDI2 Device* in order to playback signals via the hardware MIDI synthesizer on the DSP24 MEDIA 7.1). Below that the *Channel* parameter allows you to select the MIDI channel for the selected track. The field *Prog.* provides the possibility to select the program number of the instrument you want to use. The *Bank* field is used to select the variation / bank for the GS instrument you want to select. Please note that you have to multiply the variation value with 128 before you enter it into the *Prog.* field.



GM/GS MIDI sounds

The synthesizer on the DSP24 MEDIA 7.1 supports the General MIDI standard. GM defines a fixed assignments of 128 standard instruments and it defines that the drum kit is played via MIDI channel 10. In the following table with all available instruments, the GM sounds are listed in the first column. The other columns are listing the so-called variations defined by Roland GS. In order to select a GM sound, you need to send a MIDI Controller 0 message with 0 as parameter and then do a program change with the program number (PC). In order to select a GS variation sound you need to send a MIDI Controller 0 message with the variation number (listed in the C0 columns) and then do a program change with the program number (PC).

PC	GENERAL MIDI	C0	1st VAR	C0	2nd VAR	C0	3rd VAR
1	(Grand) Piano 1	8	Piano 1w	16	Piano 1d		
2	(Bright) Piano 2						
3	(El. Grd) Piano 3						
4	Honky-tonk Piano						
5	El. Piano 1	8	Detuned EP 1	16	El. Piano 1v	24	60's El. Piano
6	El. Piano 2	8	Detuned EP 2	16	El. Piano 2v		
7	Harpsichord	8	Coupled Hps.			24	Harpsi o
8	Clavi						
9	Celesta						
10	Glockenspiel						
11	Music Box						
12	Vibraphone						
13	Marimba						
14	Xylophone						
15	Tubular Bells	8	Church Bell	9	Carillon		
16	Dulcimer (Santur)						
17	Drawbar Organ	8	Det. Organ 1	16	60's organ1	32*	Organ 4
18	Percussive Organ	8	Det. Organ 2			32*	Organ 5
19	Rock Organ						
20	Church Organ	8	Ch. Organ 2	16	Ch. Organ 3		
21	Reed Organ						
22	Accordion (french)	8	Acc. (Italian)				
23	Harmonica						
24	Tango Accordion						
25	Ac. Guitar (Nylon)	8	Ukulele	16	Nylon Gt. o	32*	Nylon Gt. 2
26	Ac. Guitar (Steel)	8	12-str. Guitar	16	Mandolin		
27	El. Guitar (jazz)	8	Hawaiian Gt.				
28	El. Guitar (clean)	8	Chorus Gt.				
29	El. Guitar (muted)	8	Funk Gt.	16	Funk Gt. 2		
30	Overdriven Guitar						
31	Distortion Guitar	8	Feedback Gt.				

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PC	GENERAL MIDI	C0	1st VAR	C0	2nd VAR	C0	3rd VAR
32	Guitar harmonics	8	Gt. Feedback				
33	Acoustic Bass						
34	HQ Finger Bass	8	Finger Bass				
35	HQ Picked Bass	8	Picked Bass				
36	Fretless Bass						
37	Slap Bass 1						
38	Slap Bass 2						
39	Synth Bass 1	1	Syn Bass 101	8	Synth. Bass 3		
40	Synth Bass 2	8	Synth. Bass 4	16	Rubber Bass		
41	Violin	8	Slow Violin				
42	Viola						
43	Cello						
44	Contrabass						
45	Tremolo Strings						
46	Pizzicato Strings						
47	Orchestral Harp						
48	Timpani						
49	String Ensemble 1	8	Orchestra				
50	String Ensemble 2						
51	Synth Strings 1	8	Syn Strings 3				
52	Synth Strings 2						
53	Choir Aahs	32*	Choir Aahs 2				
54	Voice Oohs						
55	Synth Voice	8	Synrh Voice2				
56	Orchestra Hit						
57	Trumpet						
58	Trombone	1	Trombone 2				
59	Tuba						
60	Muted Trumpet						
61	French Horn	1	Fr. Horn				
62	Brass Section	8	Brass 2				
63	Synth Brass 1	8	Syn Brass 3	16	AnalogBrass1		
64	Synth Brass 2	8	Syn Brass 4	16	AnalogBrass2		
65	Soprano Sax						
66	Alto Sax						
67	Tenor Sax						
68	Baritone Sax						
69	Oboe						
70	English Horn						
71	Bassoon						
72	Clarinet						
73	Piccolo						
74	Flute						
75	Recorder						
76	Pan Flute						
77	Blown Bottle						

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PC	GENERAL MIDI	C0	1st VAR	C0	2nd VAR	C0	3rd VAR
78	Shakuhachi						
79	Whistle						
80	Ocarina						
81	Lead 1 (square)	1	Square	8	Sine Wave		
82	Lead 2 (sawtooth)	1	Saw	8	Doctor Solo		
83	Lead 3 (calliope)						
84	Lead 4 (chiff)						
85	Lead 5 (charang)						
86	Lead 6 (voice)	8	Lead Voice2				
87	Lead 7 (fifths)						
88	Lead8 (bass+lead)						
89	Pad 1 (new age)						
90	Pad 2 (warm)						
91	Pad 3 (polysynth)						
92	Pad 4 (choir)	8	Pad Choir2				
93	Pad 5 (bowed)						
94	Pad 6 (metallic)						
95	Pad 7 (halo)						
96	Pad 8 (sweep)						
97	FX 1 (rain)						
98	FX 2 (soundtrack)						
99	FX 3 (crystal)	1	Syn Mallet				
100	FX4 (atmosphere)						
101	FX 5 (brightness)	8	Brightness2				
102	FX 6 (goblins)	8	Goblins2				
103	FX 7 (echoes)	1	Echo Bell	2	Echo Pan		
104	FX 8 (sci-fi)						
105	Sitar	1	Sitar2				
106	Banjo						
107	Shamisen						
108	Koto	8	Taisho Koto				
109	Kalimba						
110	Bag pipe						
111	Fiddle						
112	Shanai						
113	Tinkle Bell						
114	Agogo						
115	Steel Drums						
116	Woodblock	8	Castanets				
117	Taiko Drum	8	Concert BD				
118	Melodic Tom	8	Melo Tom 2				
119	Synth Drum	8	808 Tom	9	Elec Perc 1		
120	Reverse Cymbal						

*) instead of 32, 24 can also be used

SFX sounds

PC	General MIDI	C0=1	C0=2	C0=3	C0=4	C0=5	C0=6	C0=7	C0=8	C0=9
121	Gt. Fret Noise	Gt. Cut Noise	String Slap							
122	Breath Noise	Fl. Key Click								
123	Seashore	Rain	Thunder	Wind	Stream	Bubble				
124	Bird Tweet	Dog	Horse Gallop	Bird 2						
125	Teleph. Ring	Teleph. Ring 2	Door Creaking	Door Closing	Scratch	Wind chime				
126	Helicopter	Car Engine Start	Car Breaking	Car Pass	Car Crash	Police Siren	Train	Jet Takeoff	Starship	Burst Noise
127	Applause	Laughing	Screaming	Punch	Heart Beat	Footstep				
128	Gunshot	Machine gun	Lasergun	Explosion						

Please note that a number of MIDI applications (e.g. Logic SoundTrack24 from Emagic) are numbering MIDI program numbers from 0 to 127 while others (e.g. Steinberg's Cubase VST) are using the number range 1 to 128 instead. Depending on the software you are using, you might have to add or remove 1 to the program number (PC).

MIDI implementation table

MIDI MESSAGE	HEX CODE	DESCRIPTION	COMPATIBILITY
NOTE ON	9nH kk vv	Midi channel n(0-15) note ON #kk(1-127), velocity vv(1-127). vv=0 means NOTE OFF	MIDI
NOTE OFF	8nH kk vv	Midi channel n(0-15) note OFF #kk(1-127), vv is don't care.	MIDI
PITCH BEND	EnH bl bh	Pitch bend as specified by bh bl (14 bits) Maximum swing is +/- 1 tone (power-up). Can be changed using « pitch bend sensitivity ». Center position is 00H 40H.	GM
PROGRAM CHANGE	CnH pp	Program (patch) change. Specific action on channel 10 (n=9) : select drumset. Refer to sounds / drumset list. Drumsets can be assigned to other channels (see SYSEX MIDI channel to part assign and part to rhythm allocation)	GM/GS
CHANNEL AFTERTOUCH	DnH vv	vv pressure value. Effect set using Sys. Ex. 40H 2nH 20H-26H	MIDI
MIDI RESET	FFH	Reset to power-up condition	
CTRL 00	BnH 00H cc	Bank select : Refer to sounds list. No action on drumset.	GS/ DREAM
CTRL 01	BnH 01H cc	Modulation wheel. Rate and maximum depth can be set using SYSEX	MIDI
CTRL 05	BnH 05H cc	Portamento time.	MIDI
CTRL 06	BnH 06H cc	Data entry : provides data to RPN and NRPN	MIDI
CTRL 07	BnH 07H cc	Volume (default=100)	MIDI
CTRL 10	BnH 0AH cc	Pan (default=64 center)	MIDI
CTRL 11	BnH 0BH cc	Expression (default=127)	MIDI/GM
CTRL 64	BnH 40H cc	Sustain (damper) pedal	MIDI
CTRL 65	BnH 41H cc	Portamento ON/OFF	MIDI
CTRL 66	BnH 42H cc	Sostenuto pedal	MIDI
CTRL 67	BnH 43H cc	Soft pedal	MIDI
CTRL 80	BnH 50H vv	Reverb program vv=00H to 07H (default 04H) 00H : Room1 01H : Room2 02H : Room3 03H : Hall1 04H : Hall2 05H : Plate 06H : Delay 07H : Pan delay	DREAM
CTRL 81	BnH 51H vv	Chorus program vv=00H to 07H (default 02H) 00H : Chorus1 01H : Chorus2 02H : Chorus3 03H : Chorus4 04H : Feedback 05H : Flanger 06H : Short delay 07H : FB delay	DREAM
CTRL 91	BnH 5BH vv	Reverb send level vv=00H to 7FH	GS
CTRL 93	BnH 5DH vv	Chorus send level vv=00H to 7FH	GS
CTRL 120	BnH 78H 00H	All sound off (abrupt stop of sound on channel n)	MIDI
CTRL 121	BnH 79H 00H	Reset all controllers	MIDI
CTRL 123	BnH 7BH 00H	All notes off	MIDI
CTRL 126	BnH 7EH 00H	Mono on	MIDI
CTRL 127	BnH 7FH 00H	Poly on (default power-up)	MIDI
CTRL CC1	BnH ccH vvH	Assignable Controller 1. cc=Controller number (0-5Fh), vv=Control value (0-7Fh). Control number (ccH) can be set on CC1 CONTROLLER NUMBER (Sys. Ex 40 1x 1F). The resulting effect is determined by CC1 controller function (Sys.Ex. 40 2x 40-4A)	GS
CTRL CC2	BnH ccH vvH	Assignable Controller 2. cc=Controller number (00h-5Fh), vv=control value (0-7Fh). Control number can be set on CC2 CONTROLLER NUMBER (Sys.Ex. 40 1x 20). The resulting effect is determined by CC2 controller function (Sys.Ex.40 2x 50-5A).	
RPN 0000H	BnH 65H 00H 64H 00H 06H vv	Pitch bend sensitivity in semitones (default=2)	MIDI/GM
RPN 0001H	BnH 65H 00H 64H 01H 06H vv	Fine tuning in cents (vv=00 -100, vv=40H 0, vv=7FH +100)	MIDI
RPN 0002H	BnH 65H 00H 64H 02H 06H vv	Coarse tuning in half-tones (vv=00 -64, vv=40H 0, vv=7FH +64)	MIDI
NRPN 0108H	BnH 63H 01H 62H 08H 06H vv	Vibrate rate modify (vv=40H > no modif)	GS
NRPN 0109H	BnH 63H 01H 62H 09H 06H vv	Vibrate depth modify (vv=40H > no modif)	GS
NRPN 010AH	BnH 63H 01H 62H 0AH 06H vv	Vibrate delay modify (vv=40H > no modif)	GS
NRPN 0120H	BnH 63H 01H 62H 20H 06H vv	TVF cutoff freq modify (vv=40H > no modif)	GS
NRPN 0121H	BnH 63H 01H 62H 21H 06H vv	TVF resonance modify (vv=40H > no modif)	GS
NRPN 0163H	BnH 63H 01H 62H 63H 06H vv	Env. attack time modify (vv=40H > no modif)	GS
NRPN 0164H	BnH 63H 01H 62H 64H 06H vv	Env. decay time modify (vv=40H > no modif)	GS

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NRPN 0166H	BnH 63H 01H 62H 66H 06H vv	Env. release time modif (vv=40H ->no modif)	GS								
NRPN 18rrH	BnH 63H 18H 62H rr 06H vv	Pitch coarse of drum instr. note rr in semitones (vv=40H -> no modif)	GS								
NRPN 1ArrH	BnH 63H 1AH 62H rr 06H vv	Level of drum instrument note rr (vv=00 to 7FH)	GS								
NRPN 1CrrH	BnH 63H 1CH 62H rr 06H vv	Pan of drum instrument note rr (40H = middle)	GS								
NRPN 1DrrH	BnH 63H 1DH 62H rr 06H vv	Reverb send level of drum instrument note rr (vv=00 to 7FH)	GS								
NRPN 1ErrH	BnH 63H 1EH 62H rr 06H vv	Chorus send level of drum instrument note rr (vv=00 to 7FH)	GS								
NRPN 37xxH	BnH 63H 37H 62H xx 06H vv	Special Synthesis features controls (see §1-4- above)	DREAM								
Standard Sysex	F0H 7EH 7FH 09H 01H F7H	General MIDI reset	GM								
Standard Sysex	F0H 7FH 7FH 04H 01H 00H 11 F7H	Master volume (ll=0 to 127, default 127)	GM								
SYSEX	F0H 41H 00H 42H 12H 40H 00H 00H dd dd dd dd xx F7H	Master tune (default dd= 00H 04H 00H 00H) -100.0 to +100.0 cents. Nibblized data should be used (always four bytes). For example, to tune to +100.0 cents, sent data should be 00H 07H 0EH 08H	GS								
SYSEX	F0H 41H 00H 42H 12H 40H 00H 04H vv xx F7H	Master volume (default vv=7FH)	GS								
SYSEX	F0H 41H 00H 42H 12H 40H 00H 05H vv xx F7H	Master key-shift (default vv=40H, no transpose)	GS								
SYSEX	F0H 41H 00H 42H 12H 40H 00H 06H vv xx F7H	Master pan (default vv=40H, center)									
SYSEX	F0H 41H 00H 42H 12H 40H 00H 7FH 00H xx F7H	GS reset	GS								
SYSEX	F0H 41H 00H 42H 12H 40 01H 10H vv1 vv2 vv3 vv4 vv5 vv6 vv7 vv8 vv9 vv10 vv11 vv12 vv13 vv14 vv15 vv16 xx F7h	Voice reserve : vv1= Part 10 (Default vv=2) vv2 to vv10 = Part 1 to 9 (Default vv=2) vv11 to vv16= Part 11 to 16 (Default vv=0)	GS								
SYSEX	F0H 41H 00H 42H 12H 40H 01H 30H vv xx F7H	Reverb type (vv=0 to 7), default = 04H 00H : Room1 01H : Room2 02H : Room3 03H : Hall1 04H : Hall2 05H : Plate 06H : Delay 07H : Pan delay	GS								
SYSEX	F0H 41H 00H 42H 12H 40H 01H 31H vv xx F7H	Reverb character, default 04H	GS								
SYSEX	F0H 41H 00H 42H 12H 40H 01H 33H vv xx F7H	Reverb master level, default = 64	GS								
SYSEX	F0H 41H 00H 42H 12H 40H 01H 34H vv xx F7H	Reverb time	GS								
SYSEX	F0H 41H 00H 42H 12H 40H 01H 35H vv xx F7H	Reverb delay feedback. Only if reverb number=6 or 7 (delays)	GS								
SYSEX	F0H 41H 00H 42H 12H 40H 01H 38H vv xx F7H	Chorus type (vv=0 to 7), default= 02H 00H : Chorus1 01H : Chorus2 02H : Chorus3 03H : Chorus4 04H : Feedback 05H : Flanger 06H : Short delay 07H : FB delay	GS								
SYSEX	F0H 41H 00H 42H 12H 40H 01H 3AH vv xx F7H	Chorus master level, default = 64	GS								
SYSEX	F0H 41H 00H 42H 12H 40H 01H 3BH vv xx F7H	Chorus feedback	GS								
SYSEX	F0H 41H 00H 42H 12H 40H 01H 3CH vv xx F7H	Chorus delay	GS								
SYSEX	F0H 41H 00H 42H 12H 40H 01H 3DH vv xx F7H	Chorus rate	GS								
SYSEX	F0H 41H 00H 42H 12H 40H 01H 3EH vv xx F7H	Chorus depth	GS								
SYSEX	F0H 41H 00H 42H 12H 40H 1pH 02H nn xx F7H	MIDI channel to part assign, p is part (0 to 15), nn is MIDI channel (0 to 15, 16=OFF). This SYSEX allows to assign several parts to a single MIDI channel or to mute a part. Default assignment : <table style="margin-left: 20px;"> <thead> <tr> <th>part</th> <th>MIDI channel</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>9 (DRUMS)</td> </tr> <tr> <td>1-9</td> <td>0-8</td> </tr> <tr> <td>10-15</td> <td>10-15</td> </tr> </tbody> </table>	part	MIDI channel	0	9 (DRUMS)	1-9	0-8	10-15	10-15	GS
part	MIDI channel										
0	9 (DRUMS)										
1-9	0-8										
10-15	10-15										
SYSEX	F0H 41H 00H 42H 12H 40H 1pH 15H vv xx F7H	Part to rhythm allocation, p is part (0 to 15), vv is 00 (sound part) or 01 (rhythm part). This SYSEX allows a part to play sound or drumset. There is no limitation of the number of parts playing drumset.	GS								

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		Default assignment : part 0 plays drums (default MIDI channel 9) all other parts play sound.	
SYSEX	F0H 41H 00H 42H 12H 40H 1nH 40H v1 v2 ... v12 xx F7H	Scale tuning, n is MIDI channel (0 to 15), v1 to v12 are 12 semi-tones tuning values (C, C#, D, ... A#, B), in the range -64 (00H) 0 (40H) +63(7FH) cents. This SYSEX allows non chromatic tuning of the musical scale on a given MIDI channel. Default v1, v2, ...,v12 = 40H, 40H,...,40H (chromatic tuning). Scale tuning has no effect if the part is assigned to a rhythm channel or if the sound played is not of chromatic type.	GS
SYSEX	F0H 41H 00H 42H 12H 40H 1nH 1AH vv xx F7H	Velocity slope from 00H to 7FH (default = 40H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 1nH 1BH vv xx F7H	Velocity offset from 00H to 7FH (default = 40H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 1nH 1FH vv xx F7H	CC1 Controller number (00-5FH) (default = 10H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 1nH 20H vv xx F7H	CC2 Controller number (00-5FH) (default = 11H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 00H vv xx F7H	Mod pitch control (-24,+24 semitone) (default = 40H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 01H vv xx F7H	Mod tvf cutoff control (default = 40H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 02H vv xx F7H	Mod Amplitude control (-100%+100%) (default=40H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 03H vv xx F7H	Mod lfo1 rate control (default = 40H), n is don't care. Rate is common on all channels	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 04H vv xx F7H	Mod lfo1 pitch depth (0-600 cents) (default=0AH)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 05H vv xx F7H	Mod lfo1 tvf depth (default = 0H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 06H vv xx F7H	Mod lfo1 tva depth (0-100%) (default = 0H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 10H vv xx F7H	Bend pitch control (-24,+24 semitone) (default = 42H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 11H vv xx F7H	Bend tvf cutoff control (default = 40H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 12H vv xx F7H	Bend Amplitude control (-100%+100%) (default=40H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 14H vv xx F7H	Bend lfo1 pitch depth (0-600 cents) (default=0AH)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 15H vv xx F7H	Bend lfo1 tvf depth (default = 0H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 16H vv xx F7H	Bend lfo1 tva depth (0-100%) (default = 0H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 20H vv xx F7H	CAF pitch control (-24,+24 semitone) (default = 40H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 21H vv xx F7H	CAF tvf cutoff control (default = 40H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 22H vv xx F7H	CAF Amplitude control (-100%+100%) (default=40H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 24H vv xx F7H	CAF lfo1 pitch depth (0-600 cents) (default=0AH)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 25H vv xx F7H	CAF lfo1 tvf depth (default = 0H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 26H vv xx F7H	CAF lfo1 tva depth (0-100%) (default = 0H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 40H vv xx F7H	CC1 pitch control (-24,+24 semitone) (default = 40H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 41H vv xx F7H	CC1 tvf cutoff control (default = 40H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 42H vv xx F7H	CC1 Amplitude control (-100%+100%) (default=40H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 44H vv xx F7H	CC1 lfo1 pitch depth (0-600 cents) (default=0AH)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 45H vv xx F7H	CC1 lfo1 tvf depth (default = 0H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 46H vv xx F7H	CC1 lfo1 tva depth (0-100%) (default = 0H)	GS

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SYSEX	F0H 41H 00H 42H 12H 40H 2nH 50H vv xx F7H	CC2 pitch control (-24,+24 semitone) (default = 40H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 51H vv xx F7H	CC2 tvf cutoff control (default = 40H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 52H vv xx F7H	CC2 Amplitude control (-100%+100%) (default=40H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 54H vv xx F7H	CC2 lfo1 pitch depth (0-600 cents) (default=0AH)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 55H vv xx F7H	CC2 lfo1 tvf depth (default = 0H)	GS
SYSEX	F0H 41H 00H 42H 12H 40H 2nH 56H vv xx F7H	CC2 lfo1 tva depth (0-100%) (default = 0H)	GS
notes : NRPN sending method : CTRL#99=high byte, CTRL#98=low byte, CTRL#6=vv Example : NRPN 0108H = 40H -> CTRL#99=1, CTRL#98=8, CTRL#6=64 x or xx means « don't care »			

VII.Usage with software applications

For each application you are using with the DSP24 MEDIA 7.1 you have to follow some configuration steps. Basically, every stereo input or output channel of the card can be used like a normal soundcard using the corresponding devices. Normally every program will have a configuration function where you can select the devices.

Available in- and output devices

The available wave devices for playback and recording are:

- *ADSP24 Int. WaveOut* – plays audio data through the *Internal Mixer*. Note that this driver only supports 16bit/48kHz as maximum resolution and samplerate. Please note: if you use the WDM driver (Windows 2000/XP), the name of this device is *ADSP24 Int. Audio Device*.
- *ADSP24 Ext. WaveOut 1/2* – first stereo wave output device. Use this driver to play audio through output channels 1/2. Please note: if you use the WDM driver (Windows 2000/XP), the name of this device is *ADSP24 Ext. 1/2 Audio Device*.
- *ADSP24 Ext. WaveOut 3/4* – second stereo wave output device. Use this driver to play audio through output channels 3/4. Please note: if you use the WDM driver (Windows 2000/XP), the name of this device is *ADSP24 Ext. 3/4 Audio Device*.
- *ADSP24 Ext. WaveOut 5/6* – third stereo wave output device. Use this driver to play audio through output channels 5/6. Please note: if you use the WDM driver (Windows 2000/XP), the name of this device is *ADSP24 Ext. 5/6 Audio Device*.
- *ADSP24 Ext. WaveOut 7/8* – fourth stereo wave output device. Use this driver to play audio through output channels 7/8. Please note: if you use the WDM driver (Windows 2000/XP), the name of this device is *ADSP24 Ext. 7/8 Audio Device*.
- *ADSP24 Ext. S/PDIF Out* – plays audio through the stereo S/PDIF digital output (both optical and coaxial). Please note: if you use the WDM driver (Windows 2000/XP), the name of this device is *ADSP24 Ext. SPDIF Device*.
- *ADSP24 Int. Record* – records the signal from *Internal Mixer*. Use this driver to record from the internal CD or Aux input on the card. Note that this driver only supports 16bit/48kHz as maximum resolution and samplerate. Please note: if you use the WDM driver (Windows 2000/XP), the name of this device is *ADSP24 Int. Audio Device*.
- *ADSP24 Ext. Input 1/2* – stereo input driver to record analog input signals from the line, phono or microphone input. Please note: if you use the WDM driver (Windows 2000/XP), the name of this device is *ADSP24 Ext. 1/2 Audio Device*.

- *ADSP24 Ext. Input 3/4* – stereo input driver to record the output signal of the onboard hardware MIDI synthesizer. Please note: if you use the WDM driver (Windows 2000/XP), the name of this device is *ADSP24 Ext. 3/4 Audio Device*.
- *ADSP24 S/PDIF In* – records signal from the S/PDIF input of the card. Please note: if you use the WDM driver (Windows 2000/XP), the name of this device is *ADSP24 Ext. SPDIF Device*.
- *ADSP24 Digital Mixer* – with this driver you can record the output signal of the integrated digital mixer. This can be used to record output signals from one application in another program for example. Please note: if you use the WDM driver (Windows 2000/XP), the name of this device is *ADSP24 Ext. Digital Mixer*.

Additionally, the card provides an ASIO 2.0 driver called *ADSP24 ASIO*. It allows access to all input and output channels simultaneously in applications that support ASIO (like Cubase VST or Logic Audio). ASIO allows applications to record and playback at a very low latency (down to 2ms). This means that it is possible to apply realtime effects with your systems CPU input or output signals. Also, you can use software synthesizers to output through ASIO.

Please note that most applications will need special settings to ensure that the DSP24 MEDIA 7.1 is working properly. We are continuously testing the card with various popular applications. In the following sections we have provided examples for the main programs that are bundled with the DSP24 MEDIA 7.1 hardware and for a few additional famous audio applications. Please take the time to review it to avoid problems later.

Windows default audio devices

Quite a number of applications are using the default wave and MIDI devices that are selected in the Windows Control Panel. The default wave playback device is used to playback the Windows system sounds. It is also used as default output device for most audio applications. Some programs (e.g. the Windows Media Player or Intervideo WinDVD – described later) are using the default playback device only and provide no options to change the settings inside the program. Other applications (e.g. Cubase VST by Steinberg or DCart32 – described later) provide their own setup dialogs for the audio hardware.

Windows ME / 2000 / XP



Under Windows ME, 2000 and XP the default wave and MIDI devices are selected via *Control Panel > Sounds & Multimedia > Audio* (under Windows XP we recommend to switch the Control Panel to *Classic View* in order to access the Sounds & Multimedia dialog as described).

For playback you usually select one of the following devices as *Default device*:

- *ADSP24 Ext. 1/2 Audio Device* – to playback (up to) 24bit/96kHz via output channel 1/2 of the external box.
- *ADSP24 Int. Audio Device* – to playback signals via the AC-97 codec (e.g. to provide compatibility to consumer applications such as games).
- *ADSP24 Ext. SPDIF Device* – to playback signals via the optical and coaxial digital output.

For *Sound recording* you usually select one of the following devices:

- *ADSP24 Ext. 1/2 Audio Device* – to record (with up to 24bit/96kHz) from the analog line, phono or microphone input from the external box.
- *ADSP24 Int. Audio Device* – to record signals from the onboard connectors of the PCI-card (e.g. for speech recognition software or for internet telephone applications).
- *ADSP24 Ext. SPDIF Device* – to record signals from the optical or coaxial digital input.

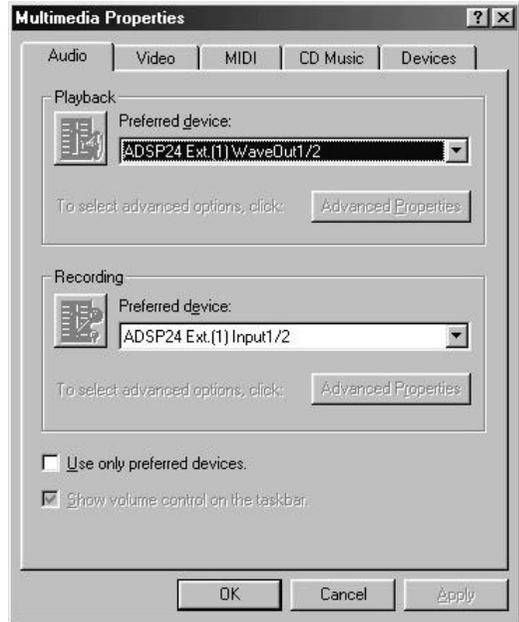
For *MIDI music playback* you would select one of the following devices:

- *ADSP24 MIDI2 Device* – to playback MIDI signals via the onboard hardware synthesizer of the card.
- *ADSP24 MIDI1 Device* – to playback MIDI signals via the MIDI output on the external box (e.g. to control an external synthesizer, keyboard or sound module).

Windows 95 / 98 / 98 SE

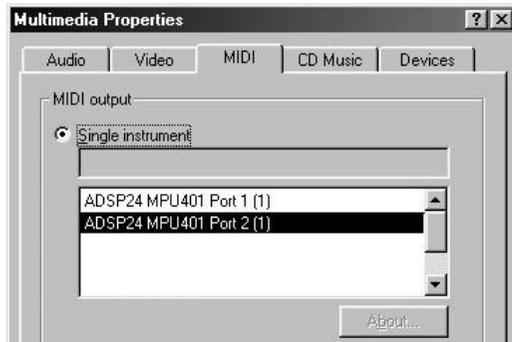
Under Windows 95 / 98 / 98 SE, the default wave devices are selectable under *Control Panel > Multimedia > Audio*. As *Preferred device* for *Playback*, you would select:

- *ADSP24 Ext. 1/2 WaveOut1/2* – to playback (up to) 24bit/96kHz via output channel 1/2 of the external box.
- *ADSP24 Int. WaveOut* – to playback signals via the AC-97 codec (e.g. to provide compatibility to consumer applications such as games). If you experience problems (e.g. crackling sound or dropouts) with the setting, you can reduce the *Performance* value under *Advanced Properties*.
- *ADSP24 Ext. S/PDIF Out* – to playback signals via the optical and coaxial digital output.



Under *Recording*, this would be typical selections:

- *ADSP24 Ext. Input 1/2* – to record (with up to 24bit/96kHz) from the analog line, phono or microphone input from the external box.
- *ADSP24 Int. Record* – to record signals from the onboard connectors of the PCI-card (e.g. for speech recognition software or for internet telephone applications).
- *ADSP24 S/PDIF In* – to record signals from the optical or coaxial digital input.



Under the *MIDI* tab, the default device for the MIDI output is selected:

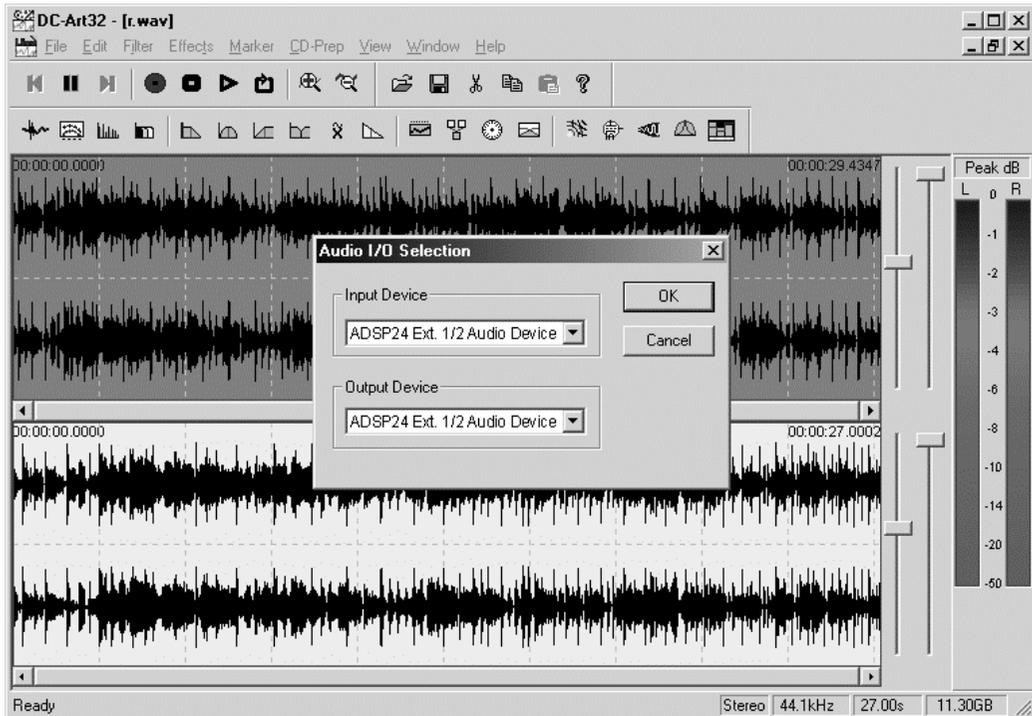
- *ADSP24 MPU401 Port 2* – to playback MIDI signals via the MEDIA 7.1.
- *ADSP24 MPU401 Port 1* – to playback MIDI signals via the MIDI output on the external box (e.g. to control an external synthesizer, keyboard or sound module).

Setting up DCart32 V4

DCart32 V4 (Diamond Cut) is included with the DSP24 MEDIA 7.1. It is an extremely powerful tool that allows you to restore any audio recording (tape, vinyl, etc.) with great results.

You can find the software on the included CD-ROM in the `\software\dcart32` directory. To install it, launch `SETUP.EXE` from this directory and follow the instructions on screen.

Once the software has been installed, launch it in order to change the default configuration. Select *Edit > Device IO Selection* from the menu.



Under *Input Device*, you select the input to record. If you select *ADSP24 Ext. 1/2 Audio Device* (*ADSP24 Ext. Input 1/2* under Windows 9x/Me), you will be able to record from the analog line input which is also switchable to phono (to connect a turntable) and from the microphone input on the external box of the DSP24 MEDIA 7.1. This will be the typical setup. If you want to record from the digital S/PDIF input (either optical or coaxial), you need to select *ADSP24 Ext. SPDIF Device* (*ADSP24 S/PDIF In* under Windows 9x/Me) instead.

The *Output Device* option allows you to select the physical output to listen to the audio signal from DCart32 V4. If you want to monitor from channel 1/2 or the headphone output on the front panel of the MEDIA 7.1, you need to select *ADSP24 Ext. 1/2 Audio Device (ADSP24 Ext. WaveOut 1/2)* under Windows 9x/Me) – of course you can also select another output channel pair if needed. If you want to playback signals from DCart32 V4 via the optical and coaxial S/PDIF output, you need to select *ADSP24 Ext. S/PDIF Device (ADSP24 Ext. S/PDIF Out)* under Windows 9x/Me) instead.

To get more information about the powerful functions of the DCart32 V4 software, please read the online documentation which will be automatically installed on your harddisk.

Setting up DART Karaoke Studio

The DSP24 MEDIA 7.1 is shipped with DART Karaoke Studio – a powerful software that allows you to remove the vocals from WAV- or MP3-files to turn them into background-karaoke versions. Also it allows to you to synchronize text-versions of the lyrics and music and provides functions to allow full screen playback of the song with the lyrics.



You can find the software on the included CD-ROM in the `\software\karaoke` directory. To install it, launch `SETUP.EXE` from this directory and follow the instructions on screen.

DART Karaoke Studio uses the default playback and recording audio devices from Windows. Please check the earlier section WINDOWS DEFAULT AUDIO DEVICES to get more information about that.

Setting up DART CD Recorder Basic 4.1

DART CD Recorder Basic 4.1 provides a easy way to make your own original audio CDs from virtually any source. The CD Recorder allows you to drag any MP3, MIDI or WAV files right onto the CD and create your original audio disc with the click of a mouse. DART CD Recorder Basic is shipped together with the DSP24 MEDIA 7.1.

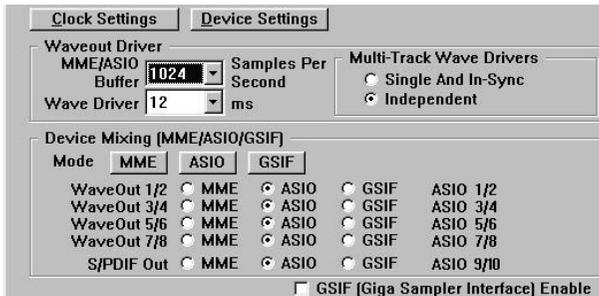


There is no separate installation method for DART CD Recorder Basic 4.1: the software is automatically installed when you install DART Karaoke Studio (check the previous section for more details). Once the software has been installed, you can access the help file via the menu inside the software. Just select *Help > Contents*.

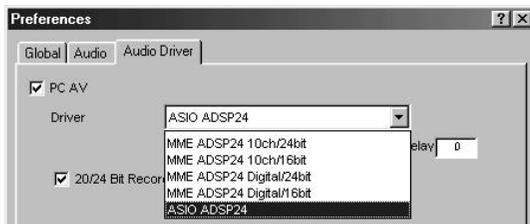
Setting up Emagic Logic SoundTrack24

Logic SoundTrack24 is a special version of the Logic Software from Emagic, designed to be used with the DSP24 series of audiocards. It can use the ASIO driver of the DSP24 MEDIA 7.1 for recording and playback. Please note that Logic SoundTrack24 v4.2 only works under Windows 9x/Me. The newer v4.8.1 of Logic SoundTrack24 also supports Windows 2000/XP. To install it, you need to launch SETUP.EXE from the separate Logic SoundTrack24 CD that was included with your DSP24 MEDIA 7.1.

- call the *H/W setting* dialog inside the *Output Mixer* control panel software.



- under *Device Settings* select the ASIO buffer size: we recommend using a value of about 1024 – depending on the system performance.
- click on the *ASIO* button under *Device Mixing*.
- make sure the option *Rate Locked* under *Clock Settings* is disabled
- set the option *MultiTrack Wave Drivers* to *Independent* (under *Clock Settings*)
- launch Logic SoundTrack24 and select the option *Audio>Audio Hardware & Drivers*.



- select *Audio & Hardware Drivers* and select *ASIO ADSP 24* as ASIO device. If you want to work with 24-bit resolution, enable the option *20/24 Bit Recording*.
- exit Logic and launch it again to activate the settings.

Please also refer to the documentation of Logic SoundTrack24 that you can find on the included Logic SoundTrack24 CD.

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When using Logic SoundTrack24, we recommend to monitor audio signals from output 1/2 on the back of the external box. In that case you can use the digital mixer of the DSP24 MEDIA 7.1 hardware to control the monitoring and the signal levels for playback. In order to use this setup, you need to patch *Mixer* to *Output 1/2* in the *Patchbay* section of the *Output Mixer* before you launch Logic. Please refer to the OUTPUT MIXER section in this manual for further reference.

Setting up Intervideo WinDVD 3.2

The DSP24 MEDIA 7.1 is shipped with Intervideo WinDVD – the famous DVD playback software.

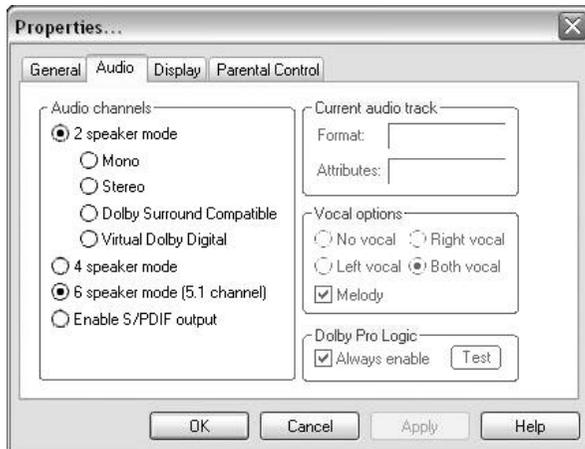
You can find the software on the included CD-ROM in the `\software\windvd` directory. To install it, launch `SETUP.EXE` from this directory and follow the instructions on screen. During the installation you need to enter a serial number. This is displayed on a sticker attached to the software and driver CD-ROM.

WinDVD by Intervideo uses the default playback audio devices from Windows. Please check the earlier section WINDOWS DEFAULT AUDIO DEVICES to get more information about that.

Setup for multi channel audio playback

WinDVD is able to playback the surround signal DVD movies directly via the separate output channels of the DSP24 MEDIA 7.1.

- Before you launch WinDVD, you need to connect *Wave Out 1/2* to *Output 1/2*, *Wave Out 3/4* to *Output 3/4*, *Wave Out 5/6* to *Output 5/6* and *Wave Out 7/8* to *Output 7/8* in the *Patchbay* section of the *Output Mixer* control panel software (important!).
- Now open the *H/W settings* dialog and make sure to enable *Multi Channel Device Support* (in the *Etc.* section).
- Make sure to select *ADSP24 Ext. WaveOut 1/2* as default playback device for Windows under *Control Panel > Sounds/Multimedia > Audio*. After that, select *Advanced > Speakers*. Now select *5.1 speakers* (or *7.1 speakers* if you use 8 instead of 6 speakers).



Now you can launch WinDVD and start playback of a DVD movie. Please note that WinDVD only allows you to change the audio properties after the playback has been started. Click with the right mouse button on the WinDVD window and then select *Properties > Audio*.

You can select *6 speaker mode (5.1 channel)* in the *Properties* dialog now and confirm it by clicking OK.

Setup for AC-3 output

WinDVD also allows you to output the AC-3 signal via the optical and coaxial S/PDIF output of the DSP24 MEDIA 7.1. If you have an external Dolby Digital compatible decoder or amplifier with a digital input, you just need one digital cable between the MEDIA 7.1 hardware and your decoder / amplifier.

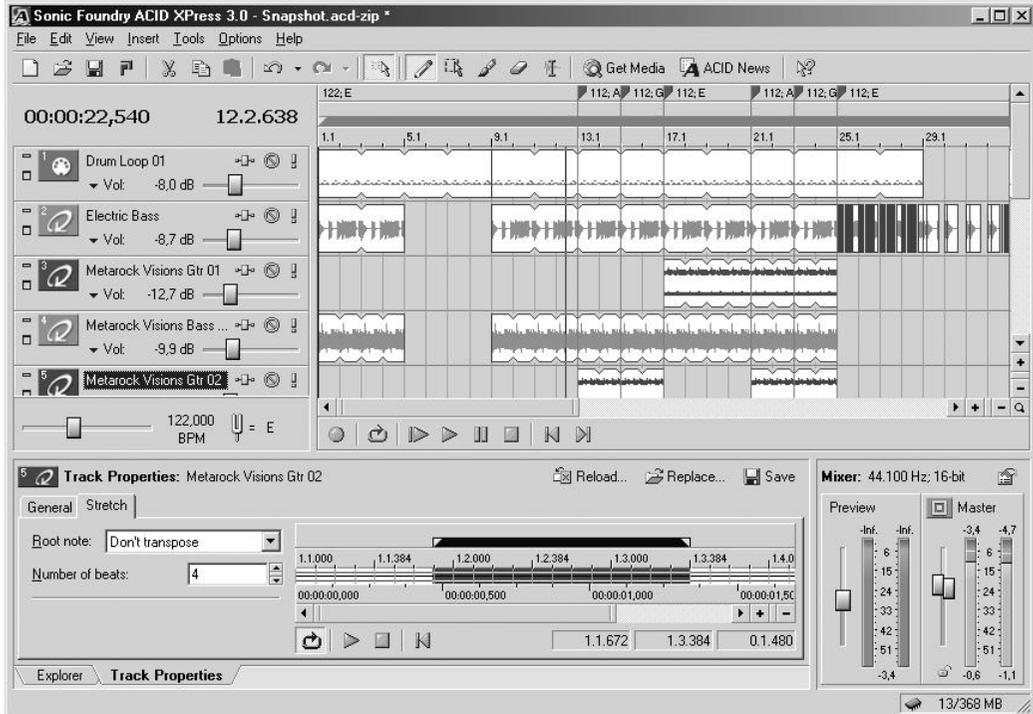
- Before you launch WinDVD, you need to connect *Wave S/PDIF Out 1/2* to *S/PDIF Out* in the *Patchbay* section of the *Output Mixer* control panel software (important!).
- Make sure to select *ADSP24 Ext. S/PDIF Out* as default playback device for Windows under *Control Panel > Sounds/Multimedia > Audio*.

Now you can launch WinDVD and start playback of the DVD movie. Click with the right mouse button on the WinDVD window and then select *Properties > Audio*. You can select *Enable S/PDIF output* in the *Properties* dialog now and confirm it by clicking OK.

If you have problems that your receiver / decoder does not recognize the AC-3 signal from WinDVD, please switch the S/PDIF output to *Professional Mode (Non-Audio)* or to *Consumer Mode* in the *H/W settings* dialog (*Etc.* section).

Setting up Sonic Foundry ACID XPress 3.0

The DSP24 MEDIA 7.1 is shipped with ACID XPress 3.0 from Sonic Foundry – a great software that allows you create original loop-based music. Use ACID to create songs, remix tracks, to arrange looped wave files to create your own music.



You can find the software on the included CD-ROM in the `\software\acidxp3` directory. To install it, launch `acidpress30c_bld284.exe` from this directory and follow the instructions on screen. The subdirectory `songs` contains a number of great demo songs that show you what you can do with ACID XPress 3.0.

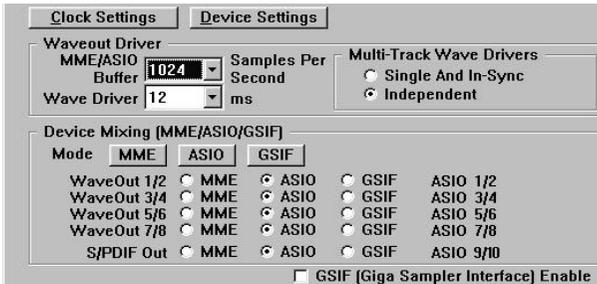
In order to use ACID XPress 3.0 you need to register yourself with Sonic Foundry. Just follow the instructions on screen once you have started the software for the first time. Once the software is running, you can access the documentation for it via the menu inside the software. Just select *Help > Contents and Index*.

ACID XPress 3.0 uses the default playback and recording audio devices from Windows. Please check the earlier section `WINDOWS DEFAULT AUDIO DEVICES` to get more information about that.

Setting up Steinberg Cubase VST/32 5.1

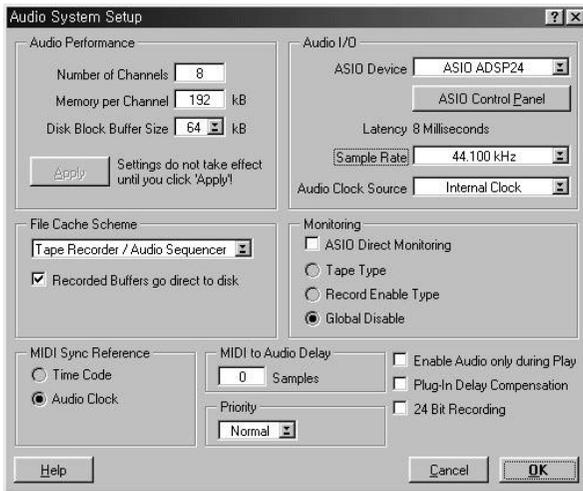
Cubase VST/32 5.1 from Steinberg uses the ASIO specification to access recording hardware. Steinberg has defined ASIO and improved support for recording multiple channels at the same time. ASIO features reduced latency for playback of VST plugins and instruments. Please note, that other Steinberg programs (like smaller versions of Cubase, Nuendo, Cubasis VST or the newer Cubase SX) have a very similar setup when using the ASIO driver. To setup the DSP24 MEDIA 7.1 in Cubase VST/32 5.1, please follow these steps:

- Call the *H/W setting* dialog inside the *Output Mixer* control panel software.

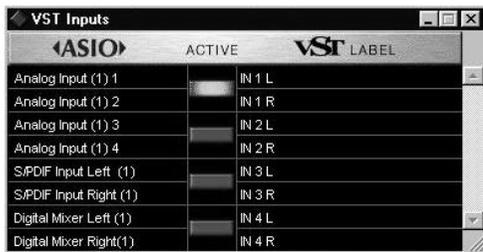


- Select the ASIO buffer size. On faster systems (Pentium III, Athlon) it is usually safe to use 512 as a small setting. On other systems you may try this setting but increase the buffer size later, depending on the performance. Also you can decrease the buffer size but please test if the performance is OK on your specific system.
- Click on the *ASIO* button under *Device Mixing*.
- Under Windows XP/2000 only: launch *SetupMME* (in the Cubase folder of your startmenu) and disable *Microsoft GS Synthesizer* as MIDI output device.
- Start Cubase VST and goto *Options > Audio Setup > System*.

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- In the section *Audio Performance*, set *Number of Channels* to 16 (recommended).
- In the *Monitoring* section, select *Global Disable* (recommended, see below).
- In the upper right corner under *ASIO Device* select *ADSP24 ASIO*.
- Below that you can choose the *Sample Rate*.
- If you want to use the DSP24's realtime monitoring functions (without adding effects to the monitor signal), select *ASIO Direct Monitoring* (see below).



To define which input and outputs to use in Cubase VST, first go to *Panels > VST-Inputs*. A window will appear that allows you to activate or deactivate each input (stereo).

Please note that the default names for the input channels might be a bit confusing as they are separating the left and right audio channels. For example: input channel 1/2 of the DSP24 MEDIA 7.1 is called by default *IN1 L* and *IN1 R*. The names *IN2 L* and *IN2 R* are used for the output signal of the onboard hardware MIDI synthesizer of the DSP24 MEDIA 7.1. You can either keep that in mind when working with Cubase VST or you can simply change the names, e.g. to *LINE 1* and *LINE 2*.

To be able to record multiple tracks of audio simultaneously in Cubase VST (e.g. from the analog input, the S/PDIF input and possibly also from the hardware MIDI synthesizer), you need to follow a number of steps. First, select *Options > Multirecord > Active* (make sure it is checked

and enabled). After that you can enable and disable recording individually for each audio track by clicking in the *R* column of the arrangement window. When you do this for the first time, Cubase will ask you for the directory to store your audio files.



The *VST Channel Mixer* (via *Panels > VST Channel Mixer* or *Audio > Monitors* under Cubase VST 3.xx) is probably the best way to assign the physical inputs to the specific audiotracks. Just click and hold the left mouse button on the gray channel button on top of each audio channel (it shows the currently assigned input – e.g. *INI R* or *LINE 1*). A small menu will appear that allows you to select the physical input. Note: under Cubase VST 3.xx you need to hold the CTRL-key while you click on this button.

To assign audio channels or other signals (e.g. the output of an effect plugin) to the physical outputs, you need to activate the output busses under *Panels > Master (Audio > Master* under Cubase VST 3.xx). This window allows you to activate a stereo bus for each physical stereo output. These busses can be used internally in Cubase VST to route signals to the outputs (the black options with yellow writing, e.g. in the *VST Channel Mixer*). You can find more information about this in the Cubase VST documentation.

The latest updates for Cubase VST can be downloaded from <http://www.steinberg.de>. We recommend to use at least version 3.72 under Windows 9x/Me, at least version 5.0 under Windows 2000 and at least version 5.1 under Windows XP.

Monitoring

If you disable the internal monitoring function from Cubase (*Audio System Setup > Global Disable*), the monitoring (= what you hear) will be controlled by the MEDIA 7.1 hardware. Open the *Output Mixer* control panel software and connect *Mixer* to *Output 1/2* in the *Patchbay*. Now the digital mixer of the DSP24 MEDIA 7.1 controls the complete monitoring of all input and all output signals. Just use the digital mixer in the *Output Mixer* control panel software to change the playback volume.

Alternatively you can bypass the MEDIA 7.1 hardware mixer and use Cubase VST as mixer. The advantage is that you have more flexible mixer controls and you can work completely inside Cubase VST. Also it is possible to assign realtime effects (e.g. plugins) on incoming audio signals. The negative aspect is the increased CPU load with this setup.

To bypass the hardware mixer, connect *WaveOut 1/2* to *Output 1/2* inside the *Output Mixer* software *Patchbay*. Inside Cubase, select *Tape Type* as monitoring option in the *Audio System Setup* dialog. If you want to listen to an input signal, just click on the gray channel button in the

VST Channel Mixer of the corresponding channel. The button will turn yellow to show that the input signal of this channel gets monitored in realtime. If you have assigned a certain effect or plugin to this channel, you can hear the processed signal. The limitation is that the signal gets delayed by the latency because it first gets recorded, then processed and then sent to the output.

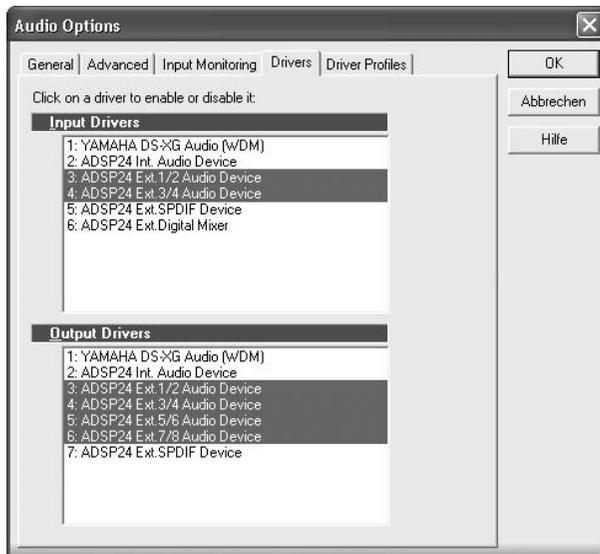
If you want to monitor incoming signals in realtime without any delay (zero latency), you can do this by activating the *ASIO Direct Monitoring* checkbox in the Cubase *VST Audio System Setup* dialog. Cubase VST will then remotely control the *Patchbay*.

Setting up Cakewalk SONAR 1.3.1

Cakewalk SONAR is the first popular audio software that uses special features of the new WDM driver model by Microsoft that was introduced with Windows 98 SE. Other operating systems that support WDM are: Windows ME, Windows 2000 and Windows XP. Older versions of Windows (NT 4.0, 98, 95) do not support WDM drivers. This means that it is strongly recommended to use the WDM drivers. SONAR will also work with the MME interface of the VXD drivers (Windows 9x/Me) but the performance will not be very good. Please also note that it is strongly recommended to use at least version 1.3.1 of SONAR. You can get free updates for the software if you use an older version. Last but not least, the performance under Windows XP is better compared to the other Windows versions according to our tests.

After launching SONAR, please click on *Options > Audio* to open the *Audio Options* dialog. All important settings related to the audiocard are made in this dialog. When you launched SONAR for the first time, you have been prompted to launch the Wave Profiler. If you have not completed this before, please click on the *Wave Profiler...* button now and follow the instructions on screen.

Please go to the *Drivers* section.



Separated into input and output devices, you can select the wave devices you want to use for recording and playback. These lists will show the devices of all soundcards that are installed in your PC.

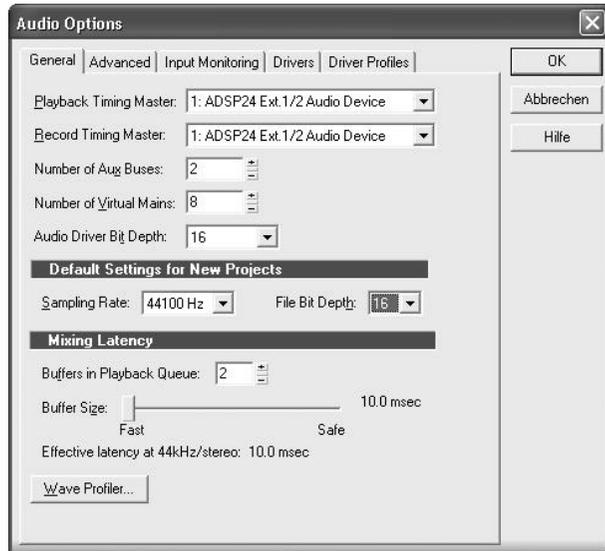
Please check these issues when you are selecting the devices:

- do not select *ADSP24 Int. Audio Device* for recording or playback
- please do not select devices from other soundcards if present
- select *ADSP24 Ext. SPDIF Device* only if you need to use the digital output (for playback) or the digital input (for recording)

Now move to the *General* section. Please make the following settings:

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- select *ADSP24 Ext. 1/2 Audio Device* as *Playback Timing Master*
- select *ADSP24 Ext. 1/2 Audio Device* as *Record Timing Master*
- select *16* or *24* as *Audio Driver Bit Depth* (depending if you want to record with 16 or 24bit resolution). Please do not select anything else, even if available
- select the *Sampling Rate* you want to use and make sure *File Bit Depth* is set at least as high as *Audio Driver Bit Depth*
- set *Buffers in Playback Queue* to *2*
- set the *Buffer Size* (= latency) to a value somewhere between *Fast* and about 1/2 of the fader. Depending on the system performance, you can easily increase this setting if you experience drop outs or reduce it if you want to get lower latency. A fast and well configured system should have no problems with latency values under about 15ms.



Now move to the *Advanced* tab. Make sure *Always Use MME Interface, Even When WDM Drivers Are Available* is disabled.

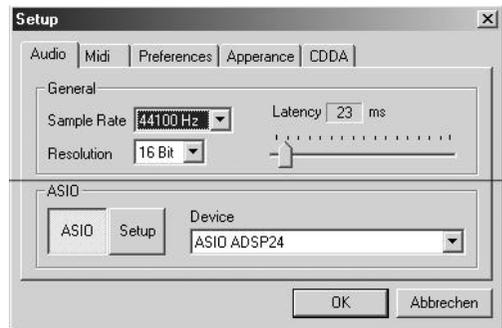
You can get the latest updates and information on Cakewalk SONAR on <http://www.cakewalk.com>.

Setting up Native Instruments Traktor DJ Studio

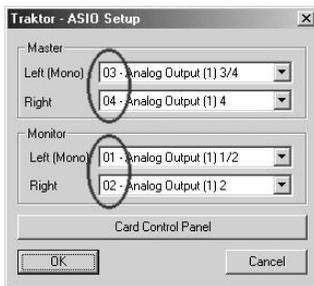
The Traktor DJ Studio by Native Instruments is a professional DJ mixing software that integrates two independant players and many extremely useful functions like the beat matcher, a very nice digital scratcher or special filter effects. To use the software in a professional environment, a multichannel audiocard with several separate and independant output channels like the DSP24 MEDIA 7.1 is needed. In this setup example, we will use channel 1/2 as stereo monitor output (for headphone monitoring) and channel 3/4 as separate and independant stereo output for the main audio signal.

First we have to assign the output channels for independant playback inside the *Output Mixer* control panel software. In order to do that, please connect *WaveOut 1/2* with *Output 1/2* (this channel will be used for headphone monitoring) and *WaveOut 3/4* to *Output 3/4* (this will be used as output for the master playback). Now connect your headphones to the headphone output on the external box and your amplifier / speakers to output 3 (left) and output 4 (right) on the back of the external box.

Inside Traktor, please click on *Setup*. Activate *ASIO* in the lower right corner of the *Audio* section and select *ASIO ADSP24* in the *Device* selection box on the right. Make sure not to select any of the other output possibilities.



Now click on *Setup* to assign the different output channels of our hardware to the main and monitor outputs of Traktor. In the dialog that appears now, you can define the channels for the Master and the Monitor output.



Please assign ASIO channel *01* to *Monitor > Left (Mono)* and ASIO channel *02* to *Monitor > Right*. Above that, assign *Master > Left (Mono)* to ASIO channel *03* and *Master > Right* to ASIO channel *04*.

When you are using Traktor, you will be able to play a track or a mix via the Master output (for the audience) while you pre-listen to another track via the headphones on the Monitor channel.



By default, the output of Traktor is played via the Master output channel. In the upper right corner of the Traktor window you can control the master output volume. In our example setup, the Master signal is played via Output 3 / 4 on the back of the external box.

If you want to monitor a signal via the headphones, you can select either player *A*, the *MIX* or player *B*. This picture shows that the signal from player *B* is audible via the headphones. If you select *MIX*, both player signals are audible over the headphone. Last but not least: if you select *A*, you can listen to player *A*.

You can get the latest updates and information on Traktor DJ Studio on <http://www.native-instruments.net/>.

VIII. Troubleshooting / FAQ

This chapter addresses common questions to solve possible problems and avoid conflict with other PC hardware or specific system configurations.

Q: What are the minimum system requirements?

A: The card will work on a 100% PCI 2.1 compliant mainboard with Intel Pentium 133MHz CPU (or higher / compatible) and at least 32 MB of memory. We strongly recommend to use at least an Intel Celeron, Pentium II or AMD Duron CPU and 128 MB of memory to be compatible with current audio software. Also note: the software you are using may have even higher system requirements. We also recommend that your PC is equipped with a DVD-ROM drive.

Q: Can I use the card with an AMD Athlon / Duron / Thunderbird CPU? Will it work with a VIA Cyrix CPU?

A: Yes, of course! There are no compatibility issues with microprocessors. Please also check the following question about VIA chipsets, as many mainboards for AMD and VIA CPUs are based on VIA chipsets.

Q: What about VIA chipsets? Can I use my VIA chipset based mainboard with the card?

A: Yes, you can use VIA based systems with the DSP24 series of cards. Unlike with some other chipsets, the configuration in this case is more 'sensitive' and the system needs to be properly configured to avoid possible trouble:

Please make sure the DSP24 PCI card gets a unique and unshared IRQ. Secondly, a recent version of the VIA 4-in-1 driver (we recommend at least v4.31) and the VIA USB Filter driver must be installed (check <http://www.via.com.tw/> or the website of your mainboard manufacturer). If you are using Windows 98SE with USB enabled, Microsoft's UHCD Update should be used as well (do a search for 'uhcd.sys' on Microsoft's Knowledge Base).

Please check if there is an update for the BIOS of your mainboard ... if so, please download and use it.

On mainboards with the KT133 and KT133A chipset, you must use high quality 133MHz memory modules only. Also check the corresponding setting in your BIOS (it should be set to 133MHz) and make sure the memory timing is not set to an incorrect (e.g. too low) value.

Set PCI DELAY TRANSACTION in your BIOS to DISABLED. Then, set PCI DEVICE LATENCY TIMER to a value of 32 or lower. PCI MASTER READ CACHING should be set to DISABLED as well (could cause performance problems, but because of the VIA southbridge bug, this setting is required).

Last but not least, we recommend to disable all power management related functions.

Check the service section on www.STAUDIO.com from time to time to get more updated info on this topic.

Q: Is it possible to install this card in a system with onboard-sound or another soundcard?

A: Yes! As long as the other soundchip does not use a Envy24 / ICE1712, there should be no problems. You should make sure that both devices do not share their IRQ. We recommend to connect the line out of your onboard soundcard to the 1/8" line in on the MEDIA 7.1 PCI card to be able to use both cards simultaneously.

Q: How many available IRQs do I need to use the card?

A: Exactly one. It should be unshared if possible, because the DSP24 is a busmaster device ... otherwise you might get performance problems. It does not matter which IRQ number has been assigned to the card.

Q: I have read that the card is full duplex, but I can't do simultaneous record and playback with Cakewalk!

A: Simultaneous record and playback needs to be enabled in Cakewalk Pro Audio. In the software, go to *Settings > Audio Options > Advanced* and make sure *Enable simultaneous record and playback* is checked.

Q: I am using Cubase VST 5.x and I'm going crazy: always when I change a setting inside External Links or the mixer, the playback suddenly stops!

A: Make sure the menu entry *Options > Active in Background* is checked inside Cubase. This is a general Cubase setting and not related to the audiocards driver.

Q: I am using Cubase VST 3.xx and I'm going crazy: always when I change a setting inside External Links or the mixer, the playback suddenly stops!

A: Goto *File > Preferences* and make sure that *Active in Background* is checked for *MIDI* and *Audio*. This is a general Cubase setting and not related to the audiocards driver.

Q: I am using Cubase VST 5.x and it crashes as soon as I select the ASIO driver under Windows 2000 / XP.

A: Launch *SetupMME* (inside the Steinberg folder of your Start-menu) and disable Microsoft GS Wavetable Synth as MIDI device. We also recommend to set *ADSP24 Int. Audio Device* as preferred playback device in *Control Panel > Sounds & Multimedia > Audio*.

Q: I am using Nuendo under Windows 2000 / XP and it crashes as soon as I select the ASIO driver.

A: Please set *ADSP24 Int. Audio Device* as preferred playback device under *Control Panel > Sounds & Multimedia > Audio*. Then reboot the system and launch Nuendo again.

Q: I am using Logic Audio 4.8.1 or 5.0 under Windows 2000 / XP and it crashes as soon as I select the ASIO driver and re-launch Logic.

A: Please set *ADSP24 Int. Audio Device* as preferred playback device under *Control Panel > Sounds & Multimedia > Audio*. Then reboot the system and launch Logic again.

Q: When recording or playing audio, I get an audible click about every 3 to 5 seconds. Is the hardware defective?

A: No! First of all, check the following two settings (under Windows 9x/Me):

Make sure the 'auto-play' function for CD-ROMs is disabled. Goto *Control Panel > System > Device Manager > CD-ROM* and select *Properties* for all CD-ROM drives. Now disable *Auto Insert Notification* under *Settings*.

DMA access for your IDE HDDs must be enabled. Goto *Control Panel > System > Device Manager > Disk Drives* and select *Properties* for each IDE-HDD you have installed (an entry is typically called *GENERIC IDE DISK TYPExx*). Now enable *DMA* under *Settings*.

Please check these settings from time to time. Some Windows installations 'loose' the DMA and CD-ROM notification settings when you are changing certain elements in the hardware configuration or if you boot Windows in Safe Mode.

Under Windows 2000/XP, please check the next section in this chapter with more details about optimizing your system for audio editing and recording.

Q: I can hear cracks and noise when I play my recorded audio signal! Is this a hardware problem?

A: In most cases this problem can be solved by changing the interrupt which has been assigned to your hardware. Check in *Control Panel > System > Device Manager > Computer > Properties* if there is another hardware component using the same interrupt as the DSP24 PCI-card (it should have its own interrupt, especially on mainboards using the VIA chipset). Except an *IRQ-Holder* (IRQ steering) entry, no other device should be listed with the same IRQ number. If you find such a problem, you usually have to install the DSP24 PCI card into a different PCI slot. On some mainboards you can change the IRQ assignment inside the BIOS of your mainboard.

Q: I can hear noise when I move a window or fader on screen inside my audio application. I am using an ATI Rage 128 graphic card.

A: Please download and install current drivers for your graphic card and set the bit-depth to 32bit (not lower). This will reduce the system load the graphic card is causing.

Q: I can hear noise when I move a window or fader on screen inside my audio application. I am using an Matrox Millenium/Mystique/G200 card.

A: Please download and install current drivers for your graphic card. Inside the Matrox specific options you can find a setting called *Busmastering* - please disable it.

Q: Can I use Logic SoundTrack24 under Windows 2000/XP?

A: You need at least version 4.8.1 of Logic SoundTrack24 (also called "Volume2") in order to use it under Windows 2000/XP. The older release v4.2 (sometimes called "Volume1") only supports Windows 9x/Me. Please contact ST Audio and/or your local distributor to get more information on this topic.

Q: I am not able to change the MME / ASIO / GSIF settings for the multiclient driver in the Hardware Settings dialog.

A: Under Windows NT 4.0 and Windows 2000/XP, these settings are not available as there was no multiclient support for GigaSampler-/Studio on this operating system when this manual was created. Check www.STAUDIO.com to get more information about this topic and updated drivers.

Q: I have problems to read the provided documentation files with the PDF-extension (e.g. the Logic SoundTrack24 or the DCart32 V4 manuals). How can I resolve this?

A: To view or print PDF-files you need to use the free Adobe Acrobat Reader software which you can download for from www.adobe.com. You can also install the software from the Logic SoundTrack24 CD-ROM by launching [ar40eng.exe](#) in the [\tools](#) directory on the CD.

Q: My audio recordings from the line input sound very strange (e.g. the bass level is too high, the average volume not correct). What is causing this trouble?

A: Make sure to disable the Phono switch on the front panel if you are recording line level signals. Enable the Phono switch only if you directly connect a turntable to the MEDIA 7.1 to enable the needed RIAA EQ filtering.

Q: Why do I get error messages that the ASIO Multimedia test/configuration failed using Cubase VST, Cubasis VST or Nuendo from Steinberg?

A: This test is done by the ASIO Multimedia driver from Steinberg that simulates ASIO for soundcards without ASIO support. It would disappear as soon as this driver is configured properly. However, as the DSP24 series of cards have their own ASIO driver for Windows 9x/Me/2000/XP, you don't need to run this test at all. Just select the ASIO driver (*ASIO ADSP24*) and then the ASIO Multimedia driver will no longer be used.

Windows 2000 / XP system optimization

This section deals with the most important issues related to the installation and configuration of Windows 2000 / XP.

ACPI

The Automatic Configuration Power Interface (ACPI) functionality of Windows 2000 / XP can be very critical on PCs dedicated to HD-recording. If ACPI is enabled, Windows 2000 / XP will use one IRQ (usually 9, sometimes 11) for all PCI and all onboard devices on most PCs. IRQ sharing generally is not a big problem for modern PCI devices. However, it always affects the performance. As we want that your DSP24 series PCI card works with best possible performance, IRQ sharing should be avoided. In the case of ACPI, the IRQ sharing sometimes even causes bigger conflicts if one of the other devices in the system have problems with ACPI installations. One example: graphic cards with nVidia chipsets are known to cause system crashes or at least performance problems of the DSP24 card when they share their IRQ with our hardware.

When you are installing Windows 2000 / XP, disabling ACPI is very easy. Before you install Windows, check your BIOS for the *PNP OS INSTALLED* setting. Set it to *NO* or *DISABLED*.



During the installation process, you can select the *Standard-PC* HAL (Hardware Abstraction Layer) instead of the *ACPI-PC* HAL. To select this HAL, you need to hit F6 when you are asked to install updated device drivers for HDD controllers (SCSI, ...). Then hit F5 to choose *Standard-PC*.

If Windows 2000 / XP is already installed, it is also possible to replace the *ACPI-PC* HAL with the *Standard-PC* HAL. It is important to know that the

process that is described in the next few lines is risky in certain configurations and not recommended at all. To stay on the safe side, it is better to directly re-install Windows 2000 / XP as described above with *Standard-PC*.

Make sure that the *PNP OS INSTALLED* setting in your BIOS is disabled. No open the Device Manager (*Control Panel > System > Hardware > Device Manager*). Check the *Computer* section. Under it, you will see an entry that is called *ACPI-PC* when ACPI is enabled. When ACPI is not enabled, you will see an entry called *Standard-PC* instead (as on the picture).

Now double click on *ACPI-PC*. Continue with *Driver > Update Driver > Display a list of the known drivers for this device > Show all hardware of this device class*. In the list dialog, you can select *Standard-PC* now. Confirm your selection. Windows 2000 / XP will reboot your system after that. Note that all device drivers for all your hardware components are re-installed then because the IRQ assignment from your BIOS will be used. Once the process is completed, check the Device Manager again. It should have a *Standard-PC* entry as on this picture now.

Please note that Windows XP is not installed by default with the *ACPI-PC HAL* on most systems (unlike Windows 2000). Microsoft obviously noticed that ACPI installations are still causing too many performance and configuration issues.

APM

When you are using the *Standard-PC HAL* as recommended, you may find that Windows will not turn off the power of your PC when you shutdown the system. To change this, you need to enable Advanced Power Management (APM). Goto *Control Panel > Power Management > Power Options* and enable APM.

Background services

Some software vendors recommend their users to change the processor scheduling option from Programs to Background services, e.g. Steinberg. We noticed that especially Cubase VST and Nuendo from Steinberg but also other programs are working better when you use small buffer settings (low-latency). Interestingly, some articles about Windows 2000 / XP audio tuning claim that this tweak does not help at all and even reduces the performance of your system. Our recommendation: try it, but if you use ASIO based software by Steinberg, your system will run better with this tweak. Under Windows 2000 (not XP), goto *Control Panel > System > Advanced > Performance Options* and select *Background services*. Under Windows XP, goto *Control Panel > System > Advanced > Settings > Advanced > Processor scheduling* and select *Background services*.

Default playback device / Microsoft GS Synthesizer

Windows 2000 and XP both contain the so-called Microsoft GS Synthesizer. This software synthesizer emulates a simple Roland GS sound module. The sound quality is not excellent but OK to listen to GM/GS MIDI files. Of course you will prefer the sound quality of the onboard hardware synthesizer of your DSP24 MEDIA 7.1. Sadly, also the latency of the Microsoft GS Synthesizer is too high to use it for music creation inside a sequencer software. The offset / delay to other tracks is simply too big. Even worse: the software synthesizer is not only unusable for music production, it also can cause potential trouble.

The Microsoft GS Synthesizer always uses the default playback device that has been selected under *Control Panel > Sounds/Multimedia > Audio > Preferred Playback Device*. If you select *ADSP24 Ext. Audio Device 1/2* as default device (output 1/2 of the external box), the Microsoft GS Synthesizer will have a conflict with the ASIO driver of your DSP24 MEDIA 7.1 card. Because of that, we strongly recommend to use the *Internal Mixer* audio device instead: please select *ADSP24 Int. Audio Device* as preferred playback device when you work with ASIO applications that also use MIDI.

To avoid conflicts with the Microsoft GS Synthesizer, you can also make sure that your audio application does not use the corresponding MIDI output device. For example, if you use Cubase VST by Steinberg, disable the MIDI device in the *Setup MME* software that is accessible from your Startmenu (you need to use at least v5.1 of Cubase VST if you are running Windows XP).

Hardware detection and IRQ assignment

The DSP24 MEDIA 7.1 is using a modern busmaster I/O interface. This allows you to record and playback multiple channels of audio with extremely low CPU load and ultra low latency. This however means that conflicts with other busmaster devices and PCI cards need to be avoided or you may get drop-outs when you record or playback audio signals with low latency.

Basically every PCI device in your system is using an IRQ to allow access to the hardware. On critical configurations it is best if your DSP24 MEDIA 7.1 is using a unique IRQ that has not been assigned to any other device in the same system. While the card usually works with a shared IRQ it still could affect the performance. On certain configurations (e.g. if you are using a mainboard based on a VIA chipset), we strongly recommend to install the card with an unshared IRQ.

In some PCs, it is not that simple to assign a unique IRQ to a certain PCI card. The reason for that is that the PCI hardware itself and its driver are not affecting the IRQ assignment at all (if the hardware follows the PCI 2.1 specifications as the MEDIA 7.1). The IRQ is assigned by the Plug and Play section of the BIOS on your mainboard. Every mainboard works a little bit different but basically IRQs are assigned depending on the PCI slot you use for the PCI-card. This means that

the actual PCI-slot position in your PC can be important to improve the performance of the hardware installation.

PCI device listing

CO-Processor	: Installed	Extended Memory	: 162016k
CPU Speed	: 400 MHz	Cache Memory	: 512k
Diskette Drive A	: 1.44M, 3.5 in.	Display Type	: EGA/UGA
Diskette Drive B	: 1.44M, 3.5 in.	Serial Port(s)	: 3F8 2F8
Pri. Master Disk	: 20428MB, UDMA 2	Parallel Port(s)	: 378
Pri. Slave Disk	: None	DRAM Type	: SDRAM
Sec. Master Disk	: CD-ROM, UDMA 2	SPD On Module(s)	: Yes
Sec. Slave Disk	: None	Data Integrity	: Non-ECC

PCI device listing.....							
Bus No.	Device No.	Func No.	Vendor ID	Device ID	Device Class	IRQ	
0	4	1	8086	7010	IDE Controller	14/15	
0	4	2	8086	7010	Serial bus controller	5	
0	10	0	1073	0010	Multimedia device	7	
0	11	0	1412	1712	Multimedia device	10	
1	0	0	1028	0518	Display controller	11	

On most modern PCs, the BIOS displays the so-called PCI device listing table before Windows gets loaded. Maybe you have never really seen this list because it is only displayed for seconds or even less. That's no problem as you can hold the display using the PAUSE/BREAK key on your keyboard (upper right corner). After you turn on the power of your PC, press the PAUSE/BREAK key. If you see the screen on the picture below, your timing was excellent. If not, just press any other key (e.g. Enter) and then hit PAUSE/BREAK again. Repeat this process until you finally see the PCI device listing table. If you will see the title screen of Windows 9x/Me or the boot manager of Windows NT/2000/XP, you somehow missed the correct moment and you can repeat the process (first boot the operating system and perform a normal shutdown). Note that a few(!) PCs do not display this table (see below).

The list in the example screen the IDE Controller (usually onboard), the USB controller (Serial bus), two Multimedia devices (usually soundcards, but also for example TV-cards) and the graphic card (Display controller). In each line, the assigned IRQ is displayed in the last column. The DSP24 MEDIA 7.1 can be identified by the Vendor ID **1412** and Device ID **1712**. In the screen above, you can see that the MEDIA 7.1 uses IRQ 10 (in this example). If this table is displayed but there is no entry with this Vendor and Device IDs, the card is probably not installed correctly (double check that!) in the PCI slot or maybe even defective.

How to avoid IRQ sharing

If the same IRQ number that has been assigned to the DSP24 PCI card is shown also on other entries in the PCI device listing table, the two (or more) devices are sharing one IRQ. This can affect the performance and in some situations, depending on the other devices with the same IRQ, even create major stability problems. For example, if you use a graphic card with nVidia chipset, you should avoid IRQ sharing (especially under Windows 2000/XP) with the DSP24 card.

As mentioned before, the IRQs are assigned depending on the PCI-slot. This means that you need to install the card into a different PCI-slot when you want to assign a different IRQ that is not shared. Some mainboard manufacturers (e.g. ASUS) have lists in the printed documentation that are showing the PCI slots / IRQ assignments. If you do not have that, you will need to try it. On most mainboards with VIA or AMD chipset, the third PCI slot is the best one to use, on most mainboards with Intel chipset, the second PCI slot is optimal. However, this is not a general rule as every mainboard can be different.

Please note that the IRQ number itself (e.g. 9, 10, 11, etc.) is not important. The DSP24 card will work on any of them. Also: if your BIOS allows you to assign certain IRQs to certain PCI slots, you can try this function before you review the PCI device listing table. In most cases however, all devices that share the same IRQ will use the assigned one (shared) after you change that setting. This would mean that the card has to be installed into a different PCI-slot as described above.

No PCI device listing table?

Some PCs do not display the PCI device listing table. This may have several reasons:

- The BIOS of your mainboard is very old (e.g. it does not fully support the PCI 2.1 specs). Please check with your mainboard vendor if there is a newer version and install it. This usually only happens with very old mainboards (older than about three years).
- The BIOS of your mainboard simply does not display this information. This happens for example if your mainboard BIOS is based on an older version of a Phoenix or AMI BIOS. Currently most generic PC mainboards are using BIOS software from Award.
- Your PC does not display anything or at least not any configuration information before Windows gets loaded. This happens on some PCs from Compaq, Dell or IBM for example.

Also keep in mind, that the PCI device listing table looks a bit different in some cases (e.g. if you have an AMI BIOS). The information in it is usually always the same.

It is a small limitation of your mainboard if its BIOS does not display the PCI device listing table. It means that you will have to check the IRQ assignment under Windows after the driver installation. If you already have problems with driver installation (e.g. Windows does not detect the card automatically), the most important diagnostic tool is not available with the missing PCI device listing table. Under Windows, you can check the IRQ assignment of the devices in the *Device Manager*. Except the so-called *IRQ-Holder*, nothing should be displayed with the same IRQ number if you want to have an unshared, unique IRQ for the DSP24 card.

IX. Support / Contact

ST Audio offers various resources to provide customer support. Please visit our website www.STAUDIO.com to access our customer *Service* area.

The extensive *Knowledge Base* and *FAQ* sections of our website, deal with common issues and are updated frequently by us. Please check this resource from time to time to get the latest updates on your DSP24 card.

The Q&A forum on the website provides help – please use it to discuss all issues related to our products. Our qualified support staff from all over the planet (and some from other planets) will help you to solve issues you may have. This ensures the fastest reply possible, as tech support staff in different counties/time zones visit the site daily. Do not hesitate to use the Q&A forum for **any** question you might have or even positive feedback/suggestions. Other customers read the messages and will possibly reply to the requests on this forum as well.

You can also call technical support locally if needed. Please only call the technical support in the country in which you bought your DSP24 card. Below is a list representing some of our distributors:

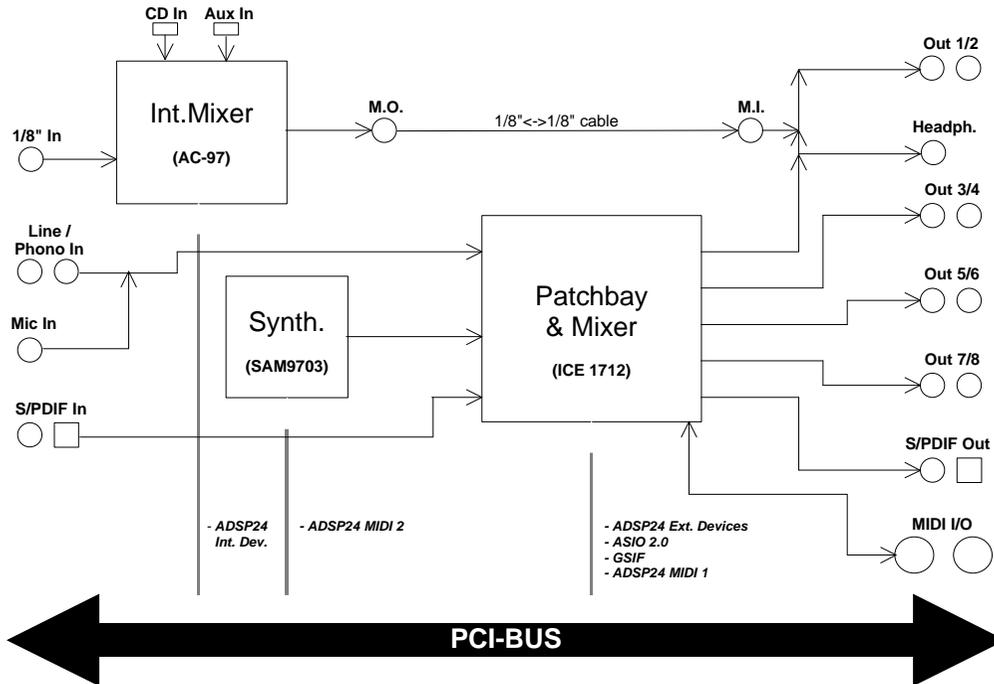
- North America: 1-800-343-0353 (Kaysound)
- Australia: +61-3-9528-5744 (Sound + Music)
- France: +33-2-40-78-22-44 (Waves System)
- Germany: +49 7152 398880 (RIDI multimedia)
- phone numbers for other countries are listed on our website in the www.staudio.com *Distribution* section.

Note: You can find updated versions of drivers, applications and documentation on our website.

X. Specifications

- PCI 2.1 compliant interface
- AKM4529 ADC/DAC with >100dB S/N ratio (a-weighted)
- 2 analog input channels (24bit/96kHz) via RCA connectors on the front of the external box / can be switched from line level (-10dBv) to phono level (RIAA EQ) with a push button on the front panel
- high quality balanced 1/4" microphone input with adjustable gain level and switchable +48V phantom power (front of the external box)
- 8 analog output channels (24bit/96kHz) via RCA connectors on the back of the external box / channel 1~6 also available via 1/8" minijack connectors
- high quality 1/4" headphone output with adjustable gain level on the front of the external box
- optical (TOSLink) and coaxial (RCA) S/PDIF in- and output on the front of the external box with support for 24bit/96kHz / output of AC-3 signals possible
- supported sample rates: 22.05, 32, 44.1, 48kHz, 88.2 and 96kHz for both recording and playback
- onboard hardware synthesizer by DREAM (Roland GM/GS soundset in 4MB ROM) with 48 voice polyphony, 16 channel multitembral and reverb/chrous effect processor.
- internal CD in plus Aux in via 18bit AC-97 Codec (*Internal Mixer*) (pin-alignment: Left, Ground, Right)
- additional line input via 18bit AC-97 Codec (*Internal Mixer*) to integrate other sound sources such as the onboard soundcard or a TV card
- MPU-401 compatible MIDI interface on the back of the external box with 16 input and 16 output channels
- optimized for Windows XP (drivers for Windows 9x/Me, NT4 and Windows 2000 are also available) with support for WDM, ASIO 2.0, GSIF, ultra-low-latency, direct monitoring (zero latency)

Block diagram



The graphic above shows the (simplified) block diagram of the DSP24 MEDIA 7.1 card. Here is a quick explanation for the picture:

On the left side, you can see the input connectors: *CD In* & *Aux In* (both internally on the PCI card) and the *1/8" Line In* (on the bracket of the PCI card) as well as *Line/Phono In*, *Mic In* and *S/PDIF In* (on the external box).

The *M.O.* connector on the PCI card is connected with the supplied *1/8"* cable with the *M.I.* connector on the external box (check chapter III. **HARDWARE INSTALLATION / CONNECTION** for more information).

On the right side of the diagram you can find the available output connectors: *Output 1/2*, *Headphone Out*, *Output 3/4*, *Output 5/6*, *Output 7/8* and *S/PDIF Out* (all on the external box). Additionally *MIDI I/O* connectors are shown on the right side.