

AudioSystem



The Mastering Soundcard

Manual (English)

CE declaration

We:

TerraTec Electronic GmbH, Herrenpfad 38, D-41334 Nettetal, Germany

hereby declare that the product:

AudioSystem EWX 24/96

to which this declaration refers complies with the following standards or standardizing documents:

1. EN 55022
2. EN 50082-1

The following are the stipulated operating and environmental conditions for the said compliance:

Residential, business and commercial environments and small-company environments.

This declaration is based on:

test report (s) of the EMC testing laboratory



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Contents.

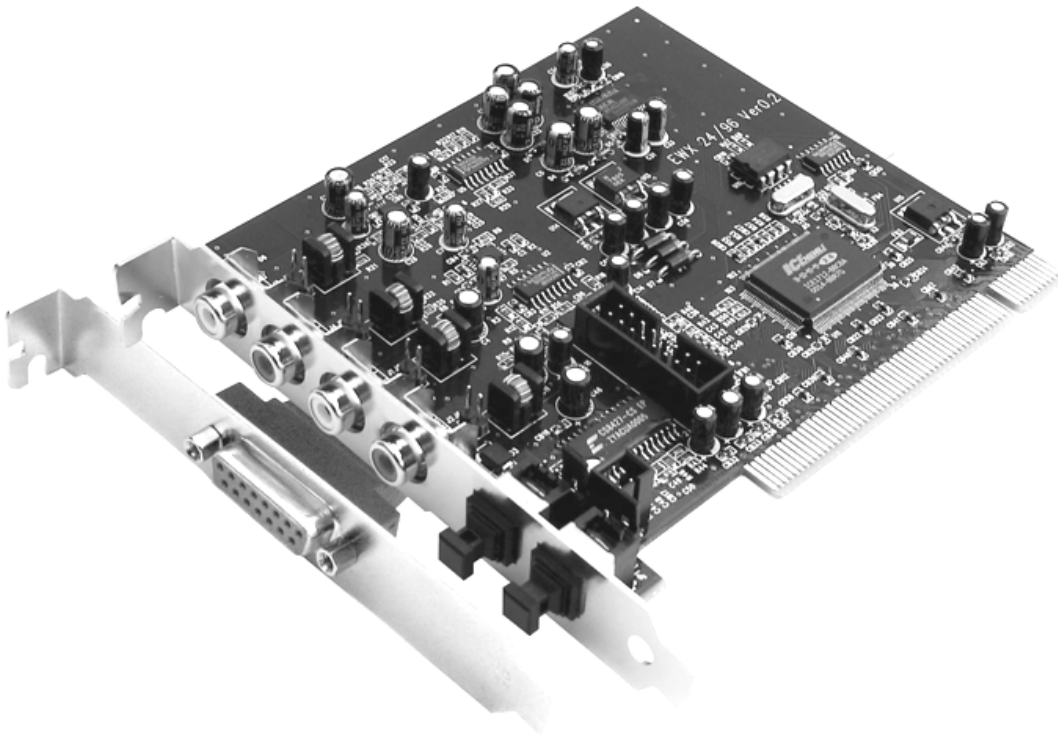
Welcome.....	5
Installation.....	7
The EWX 24/96 Layout.....	8
Installing the Card.....	9
The AudioSystem EWX 24/96 Package Contents:	9
And here's what to do, step by step:.....	10
Driver Installation.....	11
Installation in Windows 98 (SE).....	12
Uninstalling the Driver in Windows 95 and 98.....	16
Driver installed – this is what it looks like.....	17
The Multimedia Settings.	18
Installation in Windows NT 4.0.	20
Installation in Windows 2000.....	23
Installation in Windows ME.	27
The Card Connections and their Application.	30
Overview.....	30
Connector options at a glance.	30
The Analog Outputs of the EWX 24/96.	31
The Basics.	31
Stuff Worth Knowing.....	31
Analog Inputs of the EWX 24/96.	32
The Basics.	32
Signal Routing through the EWX 24/96	34
Connecting and Recording from a Record Player.	34
Microphone.	35
The Digital Connectors on the EWX 24/96.	36
Connection and Settings in the EWX Control Panel.....	36
Stuff Worth Knowing.....	38
The Internal Digital Input.	39
The Basics.	39
Jumper Settings and Internal Digital Connections.....	39
The Software.....	40
The Drivers.....	41
The Most Important: WavePlay and WaveRecord.	43
The ASIO Driver.	43
The GSIF Driver.....	44
The MIDI Driver.	44

The EWX Control Panell.....	45
How does the EWX Control Panel work?	45
The Mixer Area (above).....	46
The Settings (below).	47
The Master Clock.	47
Color- Coding the Display.	48
Digital Out.	49
The TerraTec Logo.	49
Close.	49
GigaSampler LE.....	50
WaveLab Lite.....	51
MusicMatch Jukebox.	51
FruityLoops Express.....	52
Emagic MicroLogic Fun.	52
BuzZ – ThE tRaCker.	54
The HOTSTUFF Directory.....	57
Tips and Valuable Information.	58
About Hard-drives and Necessary Space.	58
The DMA Buffer Transfer Latency.	59
Differing Sample Rates / SR Conversion.....	59
Appendix.	61
FAQ – Frequently Asked Questions and their Answers.	61
EWX 24/96 Technical Specifications.	62

Welcome.

You are now the proud owner of TerraTec's EWS AudioSystem and we congratulate you on this decision. You have chosen a state-of-the-art audioproduct and we are confident that the AudioSystem will satisfy you to your expectations and will provide you with lots of fun in the years to come.

This manual will cover your AudioSystem EWX 24/96. Following is a summary of what you now have in front of you:



AudioSystem EWX 24/96

In, out, super. AudioSystem EWX 24/96 is the result of long-term experience in the PC-Audio field and reflects the progressive continual development of audio software on the PC. The AudioSystem does without all the multimedia “whoopla” like 3D-Sound, Wavetable sound-sets or connectors for (frequency) distorting CD audio cables. The AudioSystem EWX 24/96 instead offers “In-Out” on the highest Niveau in connection with mature driver architecture for all common operating systems.

High-end audio qualities. The AudioSystem EWX 24/96 makes it possible to record and play analog audio material in very high quality. The card offers you a modern

24 Bit converter chip with a resolution of up to 96 kHz. This allows the EWX 24/96 to obtain a signal to noise ratio of fat 110 dB(A) on the analog outputs!

Recording and playback of audio material on a purely digital level. The AudioSystem EWX 24/96 places both an optical stereo Input and Output in 24 Bit S/PDIF format at your disposal. With that you have amongst others the possibility to transfer already existing digitalized recordings from a DAT or Minidisk recorder to your PC without quality loss. Furthermore you have the choice of all common sample rates as well as access to settings like Copy- Protection and Generation-Bit. The port can also be used to transmit “raw data” such as a Dolby AC3 stream, for example.

Software à la carte. The EWX Control Panel – the central command unit of your EWX 24/96 – will gain your appreciation in no time. A well thought-out interface and intuitive control of all card settings turn everyday life with the AudioSystem into a conspicuously inconspicuous experience.

The driver package also leaves no wish unfulfilled. With the special ASIO 2.0 and GSIF support you can achieve extremely low latency times using programs that accommodate these features.

Furthermore, we added numerous software utilities that are helpful and fun to use. All programs have been selected by us after long-term testing and personal experience and are to be seen as a valuable and useful addition to expand the possible uses of your AudioSystem.

We hope that you enjoy using your AudioSystem EWX 24/96 and suggest that at some point you skim through this text, which we hope is entertaining. Along with the “must read” technical user information you will find typical program examples, appropriately placed for clarification. We are convinced that even experienced users can learn something from it. **You should definitely read** the short comments in this manual which are given in boxes with an exclamation mark. They contain, for example, a summary of the paragraph that follows, hints to important settings or tricks that can simplify your daily sound life decidedly.

Thanks a lot! Enjoy! Till then,

... Your TerraTec Team!

Installation.

Please note. Even as a professional you should read through the chapter “The Software.” starting on p. 40. The information about the drivers and the introduction to the EWX Control Panel are important to be able to understand your system. Thank you

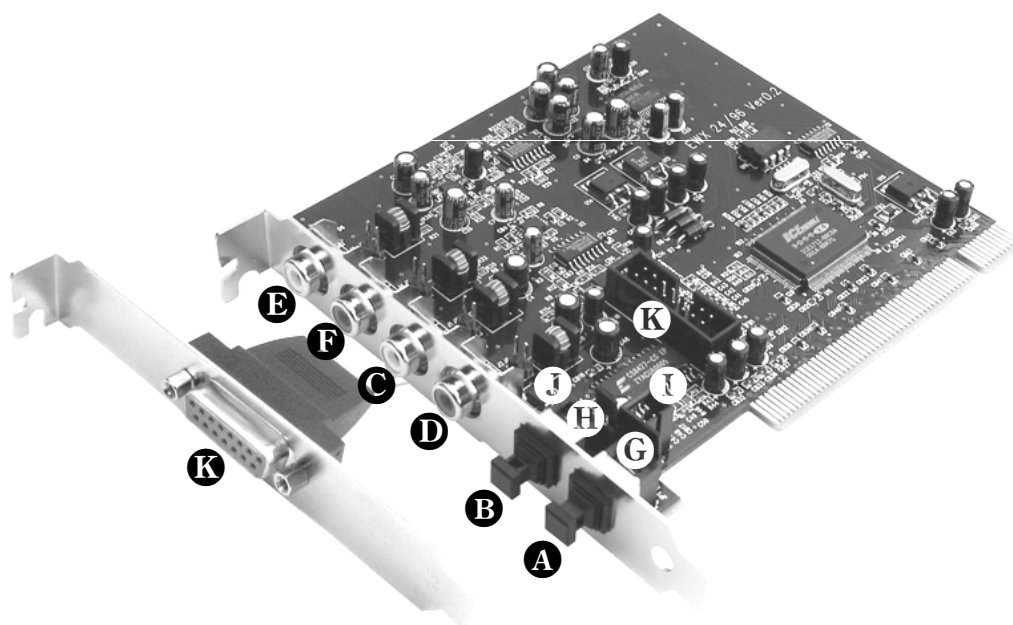


For the professionals who want to get started ASAP, here is a short overview:

- The AudioSystem EWX 24/96 uses the PCI card format. It should be installed as far away as possible from graphics cards or SCSI controllers.
- You will need 1 IRQ.
- You need a few free address ranges (usually not a problem).
- In Windows, the drivers are installed in the standard manner, with the drivers on the supplied CD-ROM.
- After installing the driver, take a look at the Device Manager and see if there is an exclamation mark. If this is the case, check out the solution suggestions we have prepared in the appendix (page 61).
- After the driver installation the software installation will start automatically. The EWX Control Panel must be installed.

So much for the short version. A detailed description of the installation with pictures follows.

The EWX 24/96 Layout.



- A** Digital Input for S/PDIF and RAW-Data (TOS link, optical)
- B** Digital output for S/PDIF and RAW-Data (TOS link, optical)
- C** Left Input (RCA jack) analog audio
- D** Right Input (RCA jack) analog audio
- E** Left Output (RCA jack) analog audio
- F** Right Output (RCA jack) analog audio
- G** J1, Digital Input Settings:
 - 1-2 → External Input (optical)
 - 2-3 → Internal Input (TTL or S/PDIF electrical)
- H** J2, Internal Digital Source Format:
 - Open → CD-ROM audio, TTL level
 - Closed → S/PDIF electrical
- I** J9, Internal Digital Input (CD-ROM audio, TTL level)
- J** J10, Internal Digital Output (S/PDIF electrical)
- K** Connector for MIDI adapter kit or TerraTec phono PreAmp (both optional)

Installing the Card.

Before installing the sound card, please take note of any special points pertaining to the configuration of your computer. Also refer to the manual for your computer and other expansion cards for their settings.

Please observe the following instructions to ensure trouble-free installation.

If difficulties still arise, carefully re-read the relevant chapter in this manual.

Please call our service hotline if you are still having problems.

First check to ensure that the package is complete.

The AudioSystem EWX 24/96 Package Contents:

- 1 TerraTec AudioSystem EWX 24/96 PCI sound card
- 1 Adaptor connector for the MIDI kit and TerraTec phono PreAmp
- 1 Audio cable RCA jack → RCA jack
- 1 Optical cable (TOS link)
- 1 Installation & driver CD-ROM
- 1 Manual
- 1 Customer service card
- 1 Upgrade card and registration number for the Nemesis Gigasampler LE
- 1 Registration card with serial number

Return the registration card to us at the earliest possible opportunity or register online at <http://www.terratec.net/register.htm>. This is important for support and hotline services.

Safety Instruction

Before opening the case, unplug the power cable from the wall socket as well as from the PC.



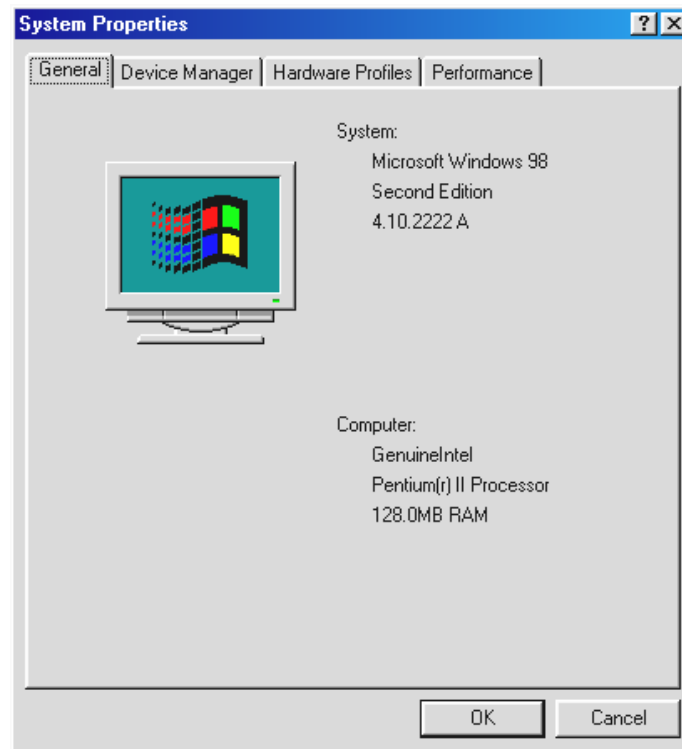
And here's what to do, step by step:

- Switch off your PC and all connected peripheral devices, such as printer, monitor and so on. Leave the AC cord connected for the time being, so that your computer is still grounded.
- Touch the metal chassis at the rear of the PC to ground yourself and discharge static. Now unplug the cord from the AC mains socket.
- Remove the cover from the case of your PC.
- Look for a free PCI expansion slot, remove the screw holding the slot cover plate in place and remove the plate. In order to insure optimal performance from your AudioSystem, choose a slot that is not directly next to another card as some components such as graphic cards or SCSI adapters emit signals that can cause distorting effects.
- Carefully remove the EWX 24/96 from its packaging and pick it up by the edges with one hand while your other hand is resting on the metal of the PC case. This will ensure that your body is statically discharged via your computer without affecting the card. Do not touch the components of the card under any circumstances.
- Align the holder at the rear of the audio card in the expansion slot in such a way that the card's gold-colored connectors are directly in line with the slot's socket. Carefully seat the card in the slot. You might have to press the card firmly into the slot to make a good contact. Take care to ensure that the contacts are precisely in line in order to avoid damaging the audio card or the mainboard in your PC.
- Insert and tighten the screw from the slot cover to secure the card in its slot.
- Reinstall the cover of your PC case.
- Now connect your audio peripherals (Hi-Fi amp, active loudspeakers, mixer, etc.) to the EWX 24/96. (Please read the chapter "The Card Connections and their Application." starting on page 30).
- Reconnect the electrical cable and all other cables to the PC. Make sure that your speakers or hifi system are set to a low volume. Start your computer.

Driver Installation.

Currently, the AudioSystem EWX 24/96 comes with drivers for the following operating systems: Windows 95 (incl. different Service releases), Windows 98 (incl. SE), Windows ME, Windows 2000 and Windows NT4. Before installing, you must determine which operating system you are using.

The operating system and version number can be found in Windows Control Panel under System Properties.



Here for example, we see the version Windows 98 Second Edition.

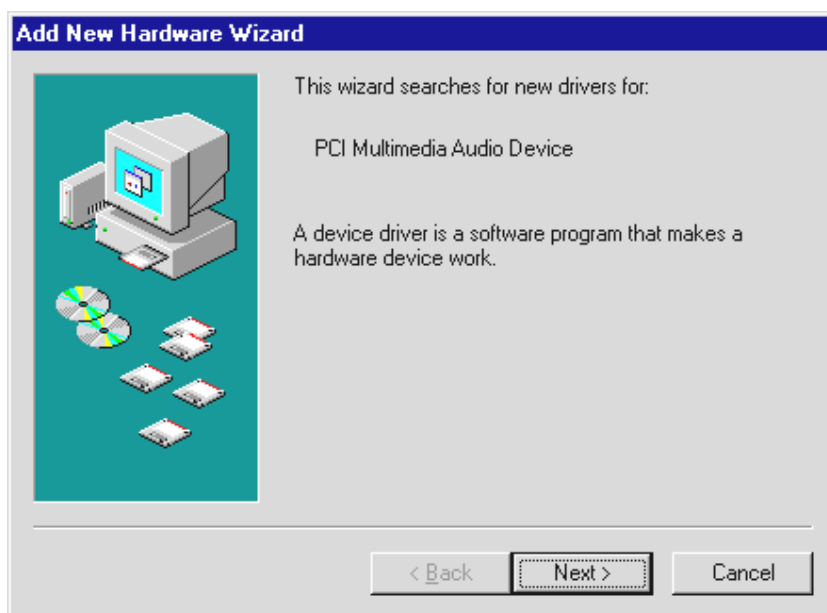
At this point we recommend using the card with Windows 98. This current version offers some system additions that have positive effects on audio/MIDI software functionality. Better timing and a higher general performance are the results – qualities, which have a lot of value for you as a musician. Therefore: It's worth it.



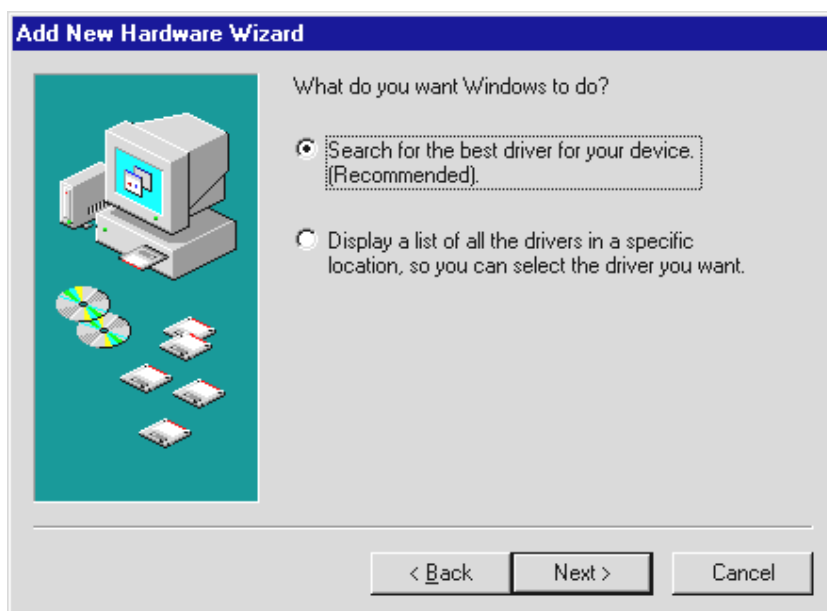
In the following driver installation description <CD> stands for the drive letter of the CD-ROM drive, in which you placed the AudioSystem EWX 24/96 driver CD.

Installation in Windows 98 (SE).

When the AudioSystem EWX 24/96 is installed, Windows 98 recognizes the card as a new hardware component and displays the following screen.



Click “Next”.

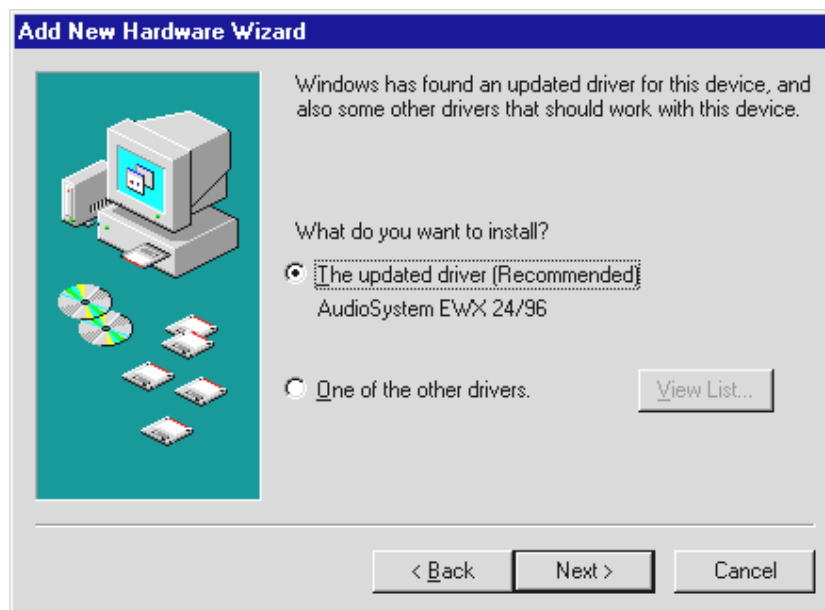


Choose “Search for the best driver for your device (Recommended)” and click “Next”.



Mark “Specify a location:”, enter the path <CD>:\Drivers\Win9x\ and click “Next”.

Alternatively you can select the path to the best driver for your EWX 24/96 by clicking on “Browse...” .



You should also click “Next” when this screen is reached.



Click “Next”.



To complete the installation click “Finish”.

Windows now installs the driver for you, documenting the process with several installation screens. At this point nothing else should occur. If during this process you are unexpectedly prompted to do something and you are unsure how to proceed, it is usually best to just press the Enter key.

If Windows asks for a driver file again, re-enter the EWX 24/96 CD-ROM folder given above. It may also be the case that a few other Windows features need to be installed

along with the card (e.g. if this is the first sound card installation for your system). For this eventuality, please have your Windows CD at hand.

After successful driver installation the software installation set-up should start automatically. If this is not the case then start the set-up from the EWX 24/96 CD.

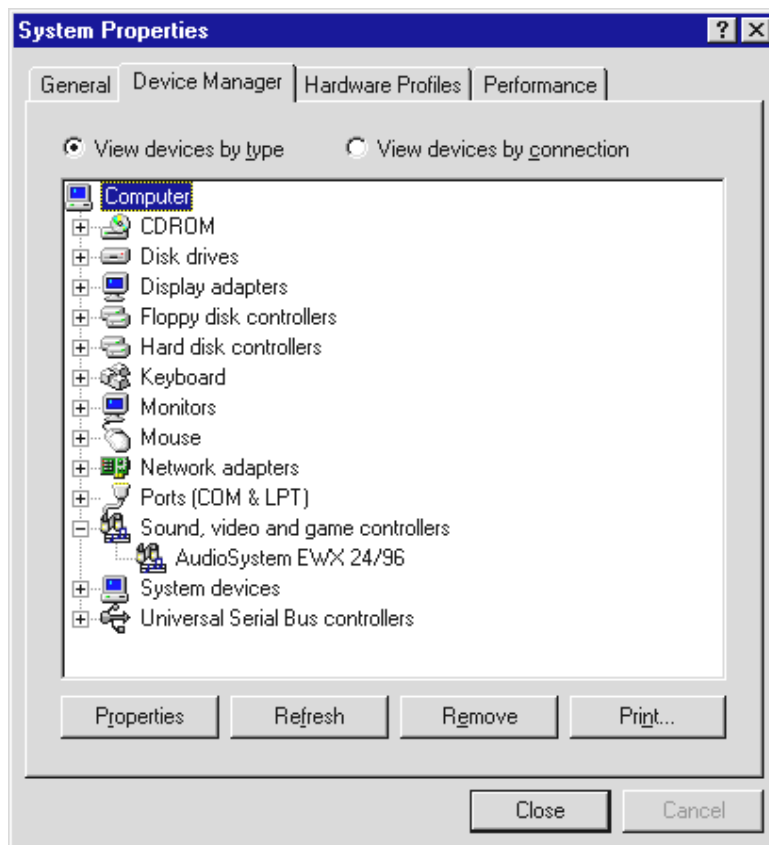
<CD>:\Applications\Windows9x_ME\EWX 2496\Controlpanel.exe

Follow the instructions on the screen. There shouldn't be any problems. In any case you must install the EWX Control Panel in order to gain anything from reading this book further. The other software isn't necessary but it's enjoyable and practical.

Continue reading on page 17.

Uninstalling the Driver in Windows 95 and 98.

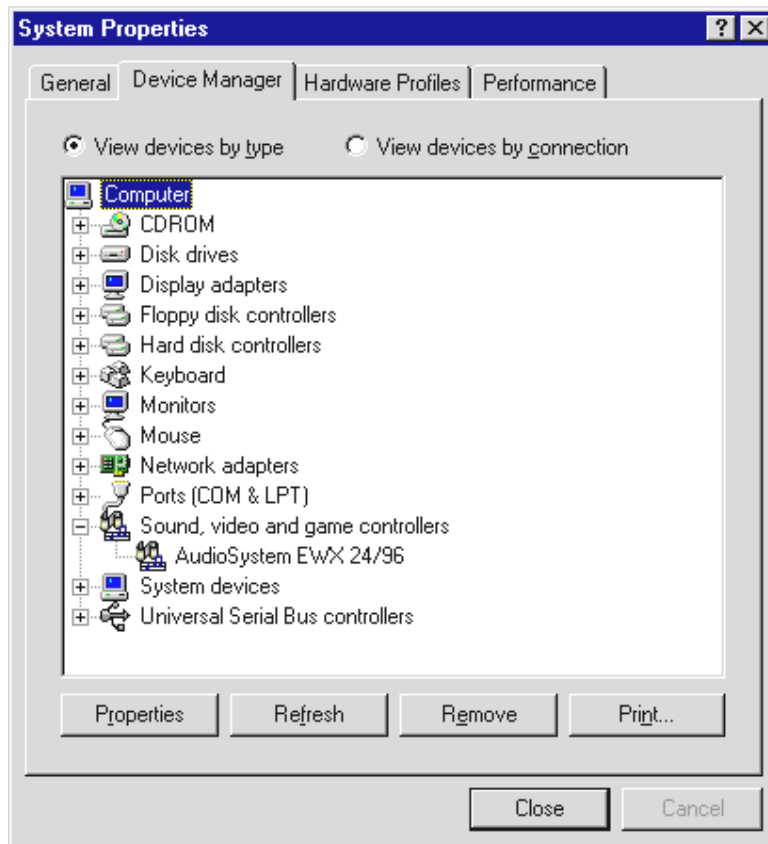
If you would like to remove the drivers from your system, it is best to do so in the Device Manager before removing the card from your PC. Mark the AudioSystem EWX 24/96 and Remove it - that's it.



The software can be removed from your system just as easily. Call up “Add/Remove Programs” in the Windows Control Panel and locate the programs that are to be deleted. Select them one after the other and each time click “Add/Remove...”.

Driver installed – this is what it looks like.

After the driver has been successfully installed, you should verify that everything is functioning properly with your Windows 9x system. In the Device Manager you get an overview of the installed and detected hardware components on your computer. The Device Manager is found in the Windows Control Panel under “System”.

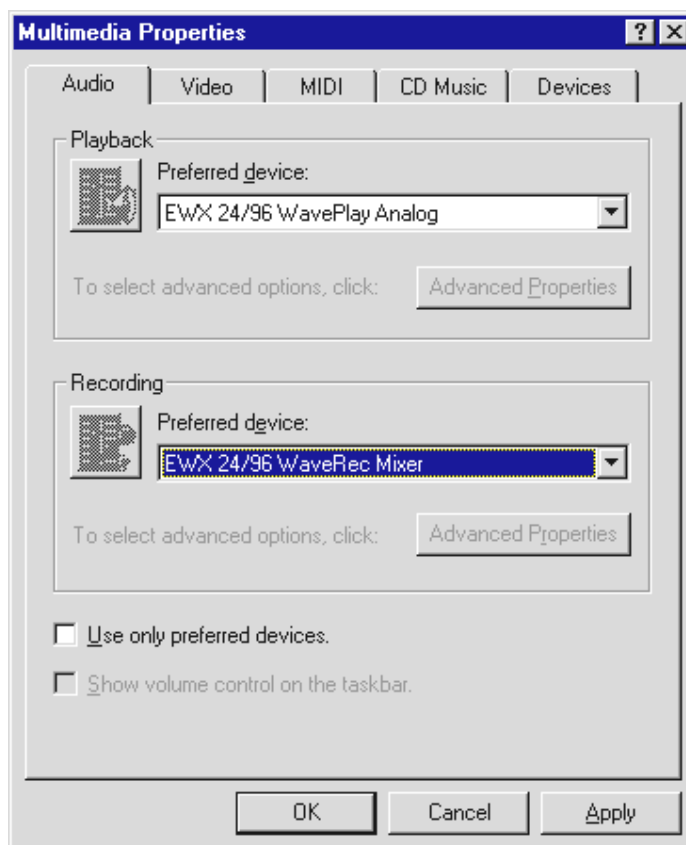


This is how the window should look if everything has been installed properly. In the picture, the header “Sound, video and game controllers” is opened. You can do this by clicking the small “+” symbol on the left hand side.

The Multimedia Settings.

To finish up you should check your system's "Multimedia" properties and adjust the audio (e.g. system sounds) playback correctly in the Windows Wave-Mapper.

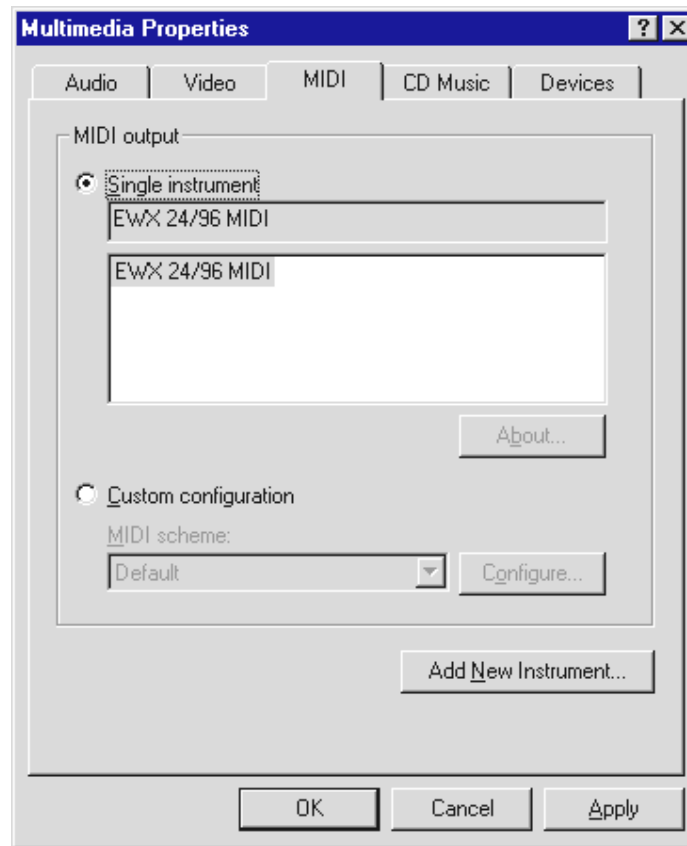
Open the Multimedia Properties (Windows Control Panel > Multimedia) and choose AUDIO. For audio playback the EWX 24/96 places several drivers at your disposal. If you would like to use the cards analog outputs, then choose "EWX 24/96 WavePlay Analog" here, otherwise "EWX 24/96 WavePlay Digital".



The output through the Wave-Mapper is the standard choice for simple multimedia players or for Windows system sounds.

For recording the best driver to choose is the "EWX 24/96 WaveRec Mixer". You probably won't need this setting as you normally have to choose the specific driver in the recording software anyway, but it doesn't hurt and there is no choice "no driver". Further information to the specific drivers can be found starting on page 41.

If you would like to use another card with a wavetable synthesizer or a software wavetable for MIDI playback (usually MIDI files) together with the EWX 24/96, then take a look at the so-called MIDI Mapper properties (MIDI). If the MIDI output settings have been changed to the EWX 24/96 MIDI interface during the driver installation, then choose the preferred settings here again.



The output through the MIDI-Mapper is the standard choice for simple multimedia players.

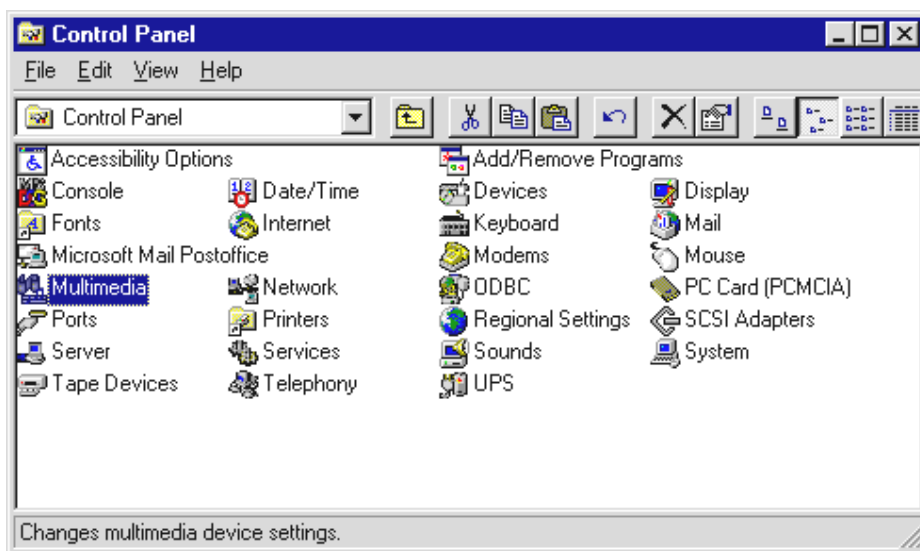
Should you choose the EWX 24/96 MIDI driver for playback, then the MIDI files, which are played over the MIDI Mapper from Windows, will be routed to the optional MIDI kit for the EWX 24/96. This allows you to use external components to create the sounds.

Please note. All of the above settings typically have no influence on MIDI playback while using common sequencer programs.

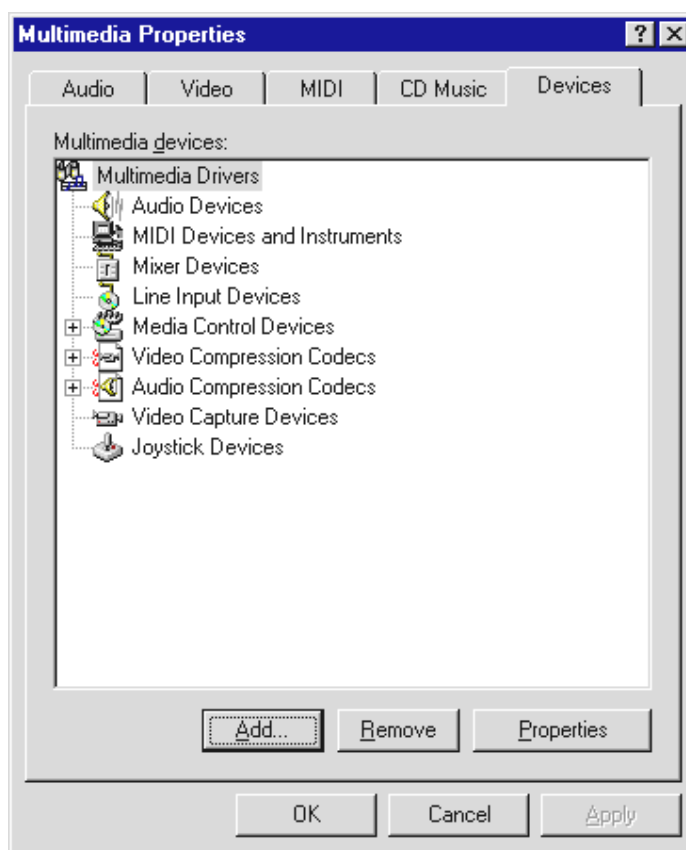


Installation in Windows NT 4.0.

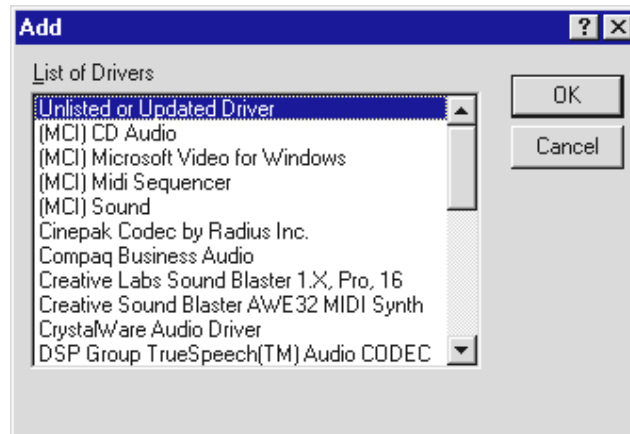
When installing the AudioSystem EWX 24/96 under Windows NT please remember that you must have administrator privileges.



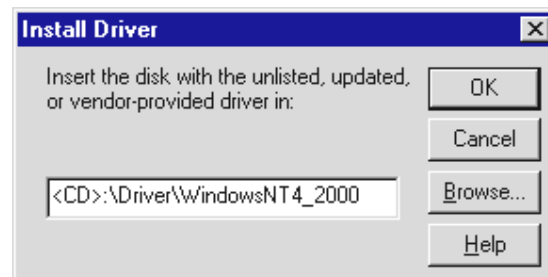
Please open “Multimedia Properties” and ...



... click “Add...”.

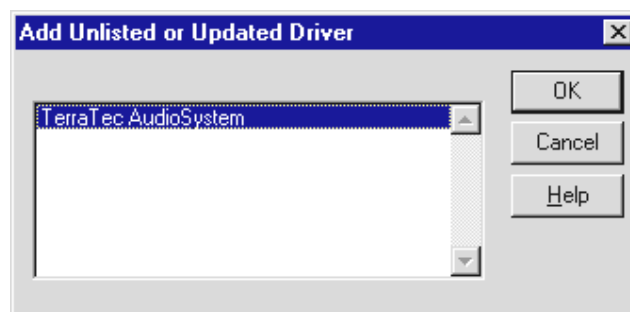


Then select “Unlisted or Updated Driver” and click “OK”.



Enter the path <CD>:\Driver\WindowsNT4_2000\ and click “OK”.

You can also use the mouse to select the path by clicking “Browse”.



Here you should select “TerraTec AudioSystem” and then click on “OK”.

After adding the device you will be requested to restart the system. Restart your Windows NT system now.

After successfully installing the drivers start the setup for the software installation. Start the setup from the EWX 24/96 CD.

<CD>:\Applications\WindowsNT_2000\EWX 2496 ControlPanel.exe

Installation in Windows 2000.

Conventionally Windows 2000 asks for a special driver certificate as soon as a new driver is recognized. This certificate tells the system that Microsoft has tested the driver in question for compatibility. As it is going to take some time still before all drivers have been certified, we recommend changing the Windows 2000 settings to “Ignore” (Windows Control Panel\System\Hardware\Driver signing).

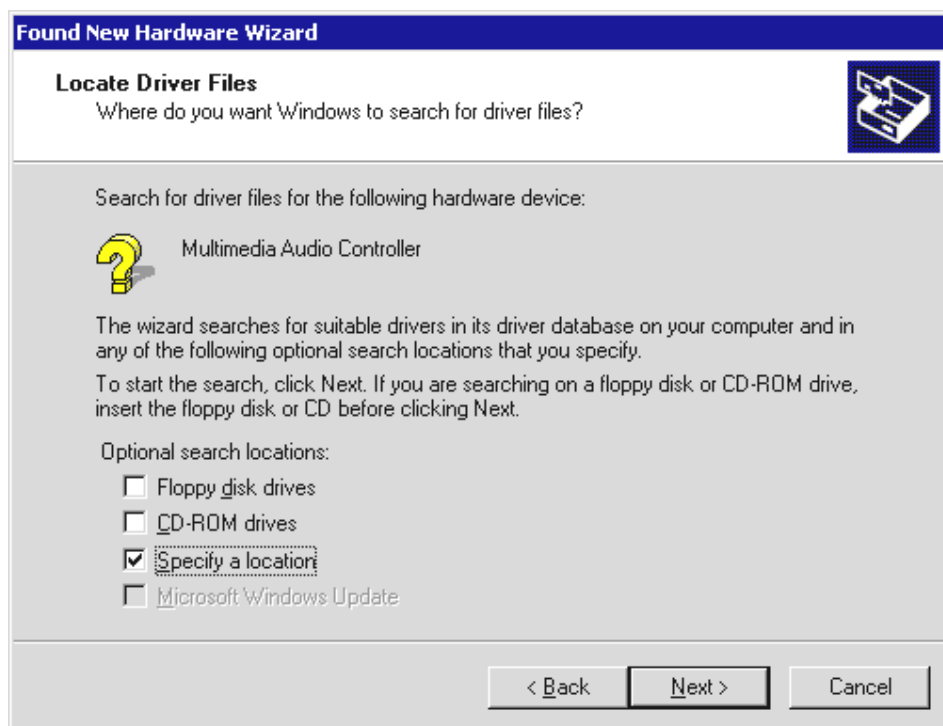
After the first boot with the EWX 24/96, the “Found New Hardware Wizard” is automatically started.



Click “Next”.



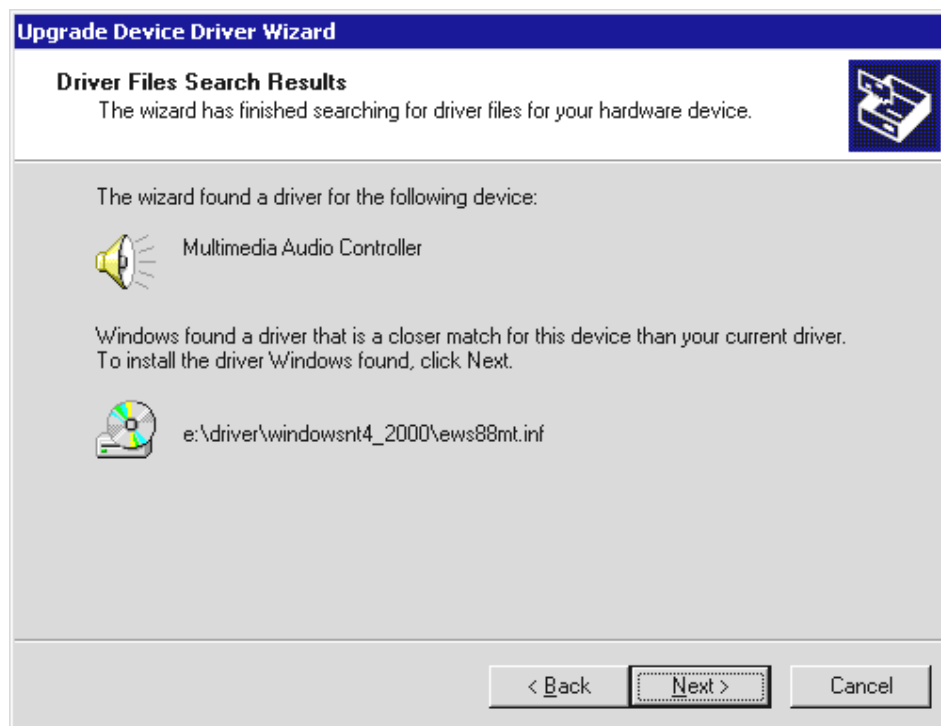
In this menu you should choose to search for a suitable driver and confirm this with “Next”.



Choose “Specify a location” and click “Next”.

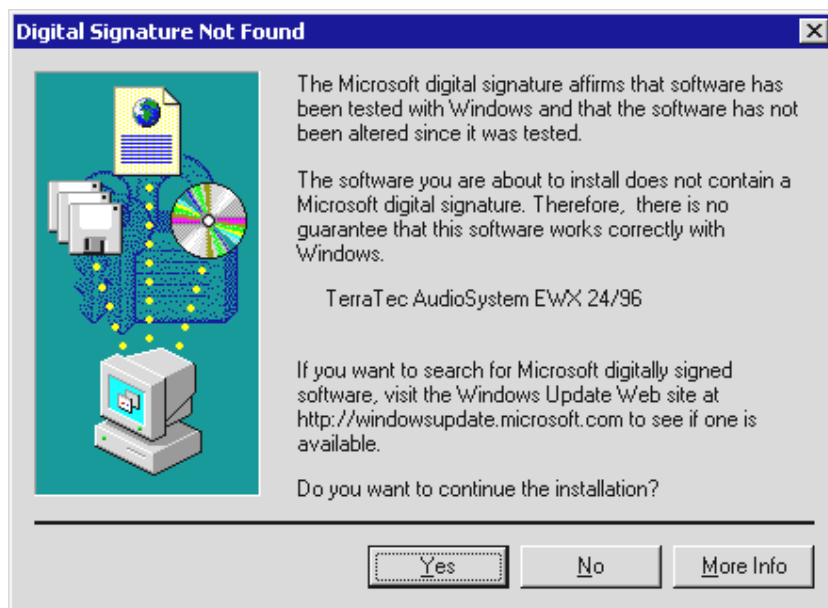


Here you need to enter the path <CD>:\Driver\WindowsNT4_2000 and then click “Next”.



Click “Next”.

If the driver signature recognition was not deactivated as described above, the following screen will be shown:



Choose "Yes".



Click "Finish".

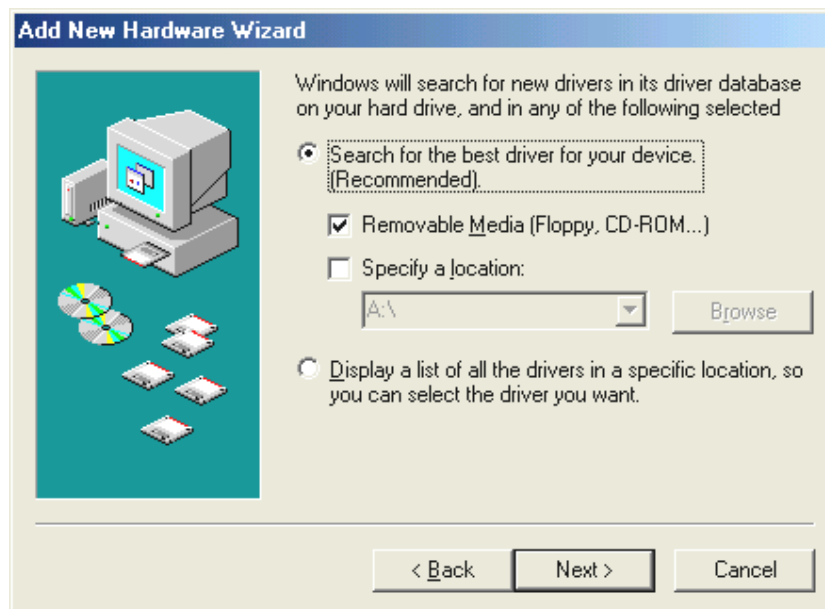
And to wrap it up restart the PC – that's it.

Installation in Windows ME.

When the AudioSystem EWX 24/96 is installed, Windows ME recognizes the card as a new hardware component and displays the following screen.



Click "Next".



Choose "Search for the best driver for your device. (Recommended)" and click "Next".



Click "Next".



Click "Next".



To complete the installation click “Finish”.

Windows now installs the driver for you, documenting the process with several installation screens. At this point nothing else should occur. If during this process you are unexpectedly prompted to do something and you are unsure how to proceed, it is usually best to just press the Enter key.

If Windows asks for a driver file again, re-enter the EWX 24/96 CD-ROM folder given above. It may also be the case that a few other Windows features need to be installed along with the card (e.g. if this is the first sound card installation for your system). For this eventuality, please have your Windows CD handy.

After successful driver installation the software installation set-up should start automatically. If this is not the case then start the set-up from the EWX 24/96 CD.

<CD>:\Applications\Windows9x_ME\EWX 2496\ControlPanel.exe

Follow the instructions on the screen. There shouldn't be any problems. In any case you must install the EWX Control Panel in order to gain anything from reading this book further. The other software isn't necessary but it's fun and makes sense.

The Card Connections and their Application.

After your audio card's successful installation we now come to the most important part – the connection of usable devices and their matching software settings.



One thing to mention first: The goal in the development of the EWX 24/96 was to create a soundcard with the least amount of extras allowing the focus to be placed on the sound quality. The AudioSystem exuberates a sense of purity with which you can be certain: Incorrect usage is next to impossible and you obtain the maximum quality all the time – so have fun!

Overview.

The AudioSystem EWX 24/96 is equipped with stereo in-and outputs for both analog as well as digital components. Analog devices (like an amplifier, tape deck, active loudspeakers or mixer) can be integrated using the RCA jacks. For devices with digital hook-ups there are the optical connectors – they work using the S/PDIF standard and allow for a completely loss-free 1:1 transfer of audio signals in all relevant resolutions.

Connector options at a glance.

Additionally you have the option to connect a MIDI adapter kit (optional accessory) and the TerraTec phono PreAmp (also optional) to the included slot hook-up. The connector uses the standard PC gameport format. But the configuration is only for the use of the above-mentioned optional accessories, not for the use of a joystick. Connecting a joystick is, however, not dangerous.

The Analog Outputs of the EWX 24/96.

The EWX 24/96 analog outputs work with a line level of -10 dBV or $+4$ dBu. Connect your active loudspeakers, auxiliary input from your amplifier, or a mixer here.



The Basics.

The AudioSystem EWX 24/96 is equipped with 2 high quality analog outputs in RCA jack form (RCA). They are mentioned in the software as 1 stereo pair, but can be regulated separately.

The accompanying audio driver is represented with the name “EWX 24/96 WavePlay Analog”.

The playback volume level for this driver can be managed using the “WavePlay Analog” controller. This is also the controller for software driven audio signals (like Direct-Sound, MME, GSIF and ASIO).

The output volume of all (in or connected to the card) signals can be managed using the “Analog Out” controller. The output level can also be switched between -10 dBV und $+4$ dBu in the EWX Control Panel (more to that later).

Safety Instruction.

Please remember to switch off all (analog) devices before connecting them. This is to avoid the danger of an electric shock - even a weak one - it also protects your speaker membranes and your hearing from sudden signal spikes. For digital devices, the volume of your playback system should at least be turned to low.



Stuff Worth Knowing

The stereo output pair is surely the most important part of your soundcard. Connect your preferred listening device here – active loudspeakers for example, or a free input on your Hi-Fi-system (but please don't use the Phono input, because it's routed to another controller!), or a studio/DJ mixer board.

The EWX 24/96 outputs operate using normal line/level controllers, which means the cards voltage output is as a rule compatible with all known consumer or studio de-

vices. The specifications -10 dBV or +4 dBu comes from the sound studio world, and represent the “Volume” (analog level) that the card puts out. +4 dBu is the “professional” setting, as it works with a higher level and therefore – to simplify it – suppresses distortion. But should you hear frequent distortion during playback then the EWX 24/96 output level needs to be reduced: first by switching to -10 dBV in the EWX Control Panel software, and then reducing the master volume if necessary. Continual exposure to level overload can cause damage to connected devices.

And in case of possible distortion due to signal overload there is a multi-colored LED above the controller to monitor the situation clearly. If the signal strength rises between -1 dB and -3 dB then the yellow light warns you. Should the red light appear then you are clipping the signal because it has reached the limit (≥ -1 dB). You have found the right setting when the LED blinks yellow now and then.

Analog Inputs of the EWX 24/96.

The EWX 24/96 line inputs allow you to adjust their sensitivity. You can switch between -10 dBV and +4 dBu and also have a gain controller to get perfect settings and insure the optimal use of the 24 Bit converter.



The Basics.

The AudioSystem EWX 24/96 is equipped with 2 high quality analog inputs in RCA jack form (RCA). They are mentioned in the software as 1 stereo pair, but can be regulated separately.

The accompanying audio driver is represented with the name “EWX 24/96 WaveRecord Analog”.

The input level sensitivity can be switched between -10 dBV and +4 dBu in the EWX Control Panel. -10 dBV is quite common in home studios (here the signals are relatively quiet, the input adjusts by using a higher sensitivity). Even hifi components normally use this “level”. +4 dBu is typically used in professional studios (the components themselves create enough “fuzz” that the sensitivity needs to be set lower). If a connected device doesn’t deliver a strong enough signal, you can use the gain controller (left in the EWX Control Panel) to raise the level in 0.5 dB steps. This utilizes the low distortion analog pre-amp.

And in case of possible distortion due to signal overload there is a multi-colored LED above the controller to monitor the situation clearly. Yellow light signalizes an optimal level (-3 dB - -1 dB) and at the red light you have reached the limit (signal overload).

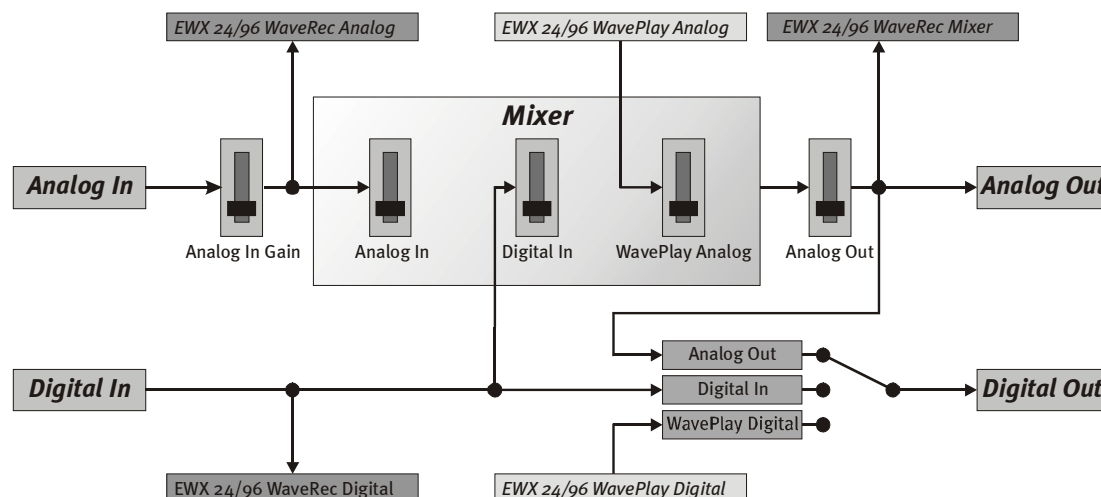
The “Analog In” controller in the EWX Control Panel mixer (the second pair of controllers from the left) defines the portion of the already digitalized signal, which is sent directly to the analog output. So please note: this controller has no effect on the signal strength (input sensitivity) when recording.

Safety Instruction.

Please remember to switch off all (analog) devices before connecting them. This is to avoid the danger of an electric shock - even a weak one - it also protects your speaker membranes and your hearing from sudden signal spikes. For digital devices, the volume of your playback system should at least be turned to low.



Signal Routing through the EWX 24/96



Connecting and Recording from a Record Player.

At the moment, it is very “hip” to archive and restore vinyl LP’s and recording. With the AudioSystem EWX 24/96 you are best equipped for high quality recording. When connecting record players, there are a few particulars that you need to know and we will tell you about them in the following.

You cannot directly connect a record player to an audio card such as EWX 24/96 because record players – technically limited by the system – send out a useful signal that is too low and extremely unbalanced. Therefore, it is absolutely necessary to interconnect an amplifier (HiFi amplifier or a special phono-amplifier with optimized equalizer). If a HiFi amplifier is used, then there is usually a TAPE Record output(!) that you can connect to the AudioSystem EWX 24/96.

We ourselves offer a small but fine pre-amp for vinyl enthusiasts. The TerraTec **phono PreAmp**, which, with its high quality anti-distortion device as well as level adjustments, is well equipped to work with different recording systems. The TerraTec phono PreAmp can be connected simply to the second EWX 24/96 slot connector (for power supply). For the output a mini-jack is used for connection to a standard soundcard. Professional music stores offer adapters from mini jack to 2 x RCA.

Software for digitizing and editing your recordings is included with the EWX 24/96. The program WaveLab lite for example, is optimized for editing large files and designed to be user-friendly, even for beginners. However, customary audio editing software alone is not completely suitable for tasks related to sound restoration. Along with the normal functions such as editing, equalizing (working with the equalizer) and

volume control, there are other functions that you need such as a “de-noiser”, “de-scratcher”, “loudness maximizer” as well as types of special spreaders and softeners. Last but not least, the ability to burn CDs would be desirable. All of these functions are contained in specialized software which you can obtain, for example, from the following leading manufacturers:

Algorithmix	www.algorithmix.com
Dartech	www.dartech.com
Diamond Cut Productions	www.diamondcut.com
Sonic Foundry	www.sonicfoundry.com
Steinberg	www.steinberg.net

Microphone.

Please note, that the inputs on the EWX 24/96 don't support microphones, not even so called *phantom powering* (48 V for the power supply). These typically have a 6.3 mm jack or 3-pole XLR jack – so save yourself the time and money on the self-made RCA adapter. If you are planning on recording using a microphone and want professional quality (e.g. spoken word, singing, or acoustical instrumentals), then there is no way around acquiring professional hardware. Dedicated microphone boosters or mixing units with the corresponding inputs and AUX Send paths (or sub-groups) can be purchased at any music store.

If you would like to use the EWX 24/96 in connection with a *Speech Recognition System*, then you need to have a microphone with it's own amplifier. There are also separate, battery-powered amplifiers you can connect between a microphone and the EWX 24/96 input.

The Digital Connectors on the EWX 24/96.

The optical digital hook-ups on the EWX 24/96 let you connect devices that use the S/PDIF format for sending and/or receiving. Among them are the DAT and Minidisk recorder. This Interface supports bit-true digital signal transfer in all the relevant resolutions.



Connection and Settings in the EWX Control Panel.

If you would like to digitally transfer audio to other devices or record audio data with your PC, then you'll be using the digital interface from the EWX 24/96. There is an optical port for recording as well as one for playback. Normally these ports (IN and OUT) can both be found on most modern devices. The OUT port is recognizable – apart from the labeling – by the fact that the red LED is lit inside. Simply connect the S/PDIF input from the EWX 24/96 with the S/PDIF output of the desired devices, or vice versa (as the case may be).

The appropriate driver for digital source recording is the “EWX 24/96 WaveRec Digital”. And for playback “EWX 24/96 WavePlay Digital” is used. More information about the drivers can be found beginning on page 41.

The output volume of digital signals coming in from external devices can be regulated using the “Digital In” controller in the EWX Control Panel. Please note: this controller has no effect on the signal strength (input sensitivity) when recording.

The EWX Control Panel also offers you the option to choose between various digital audio playback sources. In the field “Digital Out” you will find the “Source” settings:



- **Analog Out** gives the same signal via S/PDIF, which is also routed to the analog output.
- **WavePlay Digital** offers the signal from software straight to the digital output.
- **Digital In** routes the digital input signal directly to the digital output.

All three of these settings offer the following parameter options:

- **Copyright** adds a copyright mark or (by deactivation) filters it out. Hereby is the so-called “Copy-Protection-Bit” set, which *doesn't* allow the signal to be copied on normal consumer devices.
- **Original** activates what is known as the “Generation-Bit” and only allows exactly *one* digital copy to be made. If you deactivate this function - if the bit is set to 0 – you are allowed to keep merrily making copies.
- **Non-Audio** adds information to the data stream that is recognized as “Non audio” and so transfers raw data formats (like AC-3 / DVD audio, and others) for playback.

When recording using the S/PDIF port, you need to pay attention that the sample rates of both the card and the sending device are the same. To ensure an error free synchronization to the external device, set the **MasterClock** in the EWX Control Panel to “External”.



If you forget this step, then among other things, you will hear errors (drop-outs, popping) in your recordings as a result. And also vice versa (an external device should be synchronized with the EWX 24/96) you need to make the corresponding settings to your peripheral devices. The EWX Control Panel then needs to

be set (as is during operation without connected external devices) to “Internal”. If you have devices *permanently* connected in both directions then you have to decide which end should determine the synchronization.

Keep in mind, that as a safety feature, the EWX 24/96 only plays audio signals synchronized externally if the signal sample rate corresponds to the settings (for example no WAV files can be played with 22,05 kHz, while the Minidisk recorder is set at 44,1 kHz). But also in the other direction there are things to consider: There are devices that, failing the external synchronization (e.g. when the PC is shut off) or when the sample rate is too high (e.g. higher than 48 kHz) simply refuse to play audio.

The EWX 24/96 digital ports transfer all bit resolutions between 8 and 24 Bit, as well as all sample rates between 8 and 96 kHz. It is furthermore possible to use the ports for standards other than S/PDIF. Several software DVD players (e.g. Power DVD, version 2.55 or higher) support the playback of DVD audio material over the EWX 24/96. This way signals such as Dolby AC3 or DTS format can be processed through the digital ports. (Further information about Power DVD can be found at:

<http://www.cyberlink.com.tw>.)

Stuff Worth Knowing

Digital Cable.

Also the transfer of audio material over the fiber-optical cable can contain some small unnoticeable mistakes. Still you should consider choosing a cable of high quality and not too long: from more flexible plastic up to 1,5 m, to less flexible (more rigid) cable up to 5 m.

Audio differences with digital cables seem improbable at first glance, but they can happen nevertheless. This is proven, among other things, by the fact that error correction algorithms are obviously used more frequently at some times than at others to correct cables of differing qualities. In any case these audio changes are usually so minimal that you need to be careful not to mix up the myth with the reality. If you are interested: there are many somewhat entertaining militant newsgroups dealing with this subject on the Internet ;-).

AES/EBU.

Devices using the AES/EBU interface can't normally be run over the S/PDIF port - the ambitious tinkering in the hopes of a pure adapter solution will lead nowhere. Because the AES/EBU protocol is nearly identical to S/PDIF and the transmission essentially only differs in the signal strength, you can make your own converter with just a little soldering.

Backup.

The digital interface of the AudioSystem as well as the accompanying software cannot be used for backup on DAT. In principle, this can be done, however - cheaper backup options such as CDs are common today and are less time intensive.

The Internal Digital Input.

In addition to the optical digital ports, the AudioSystem EWX 24/96 offers an ***alternate*** internal connector for the digital CD ROM drive output.



The Basics.

On the EWX 24/96 board there is a pin connector with accompanying jumper. With this jumper you can set an external S/PDIF signal with the so-called TTL level, which most CD ROM drives send in. This jumper determines which digital port on the card is active – either the externally accessible optical interface, or the internal one mentioned here. Simultaneous use of both connectors is not possible.

Jumper Settings and Internal Digital Connections.

J1, sets the Digital Input Source:

1-2 → External Input (optical)

2-3 → Internal Input (TTL or S/PDIF electrical)

J2, sets the Internal Digital Source Format:

Open → CD-ROM audio, TTL level

Closed → S/PDIF electrical

J9, Internal Digital Input (CD-ROM Audio, TTL level)

J10, Internal Digital Output (S/PDIF electrical)

A signal sent over the internal connector is regulated as described in “The Digital Connectors on the EWX 24/96.”. Please read the appropriate section starting on page 36. The synchronization settings should also be taken into consideration.

The Software.

The TerraTec Team has spared no expense or effort to bring you a software package that really has something going for it. It gives you a program which allows you to ...

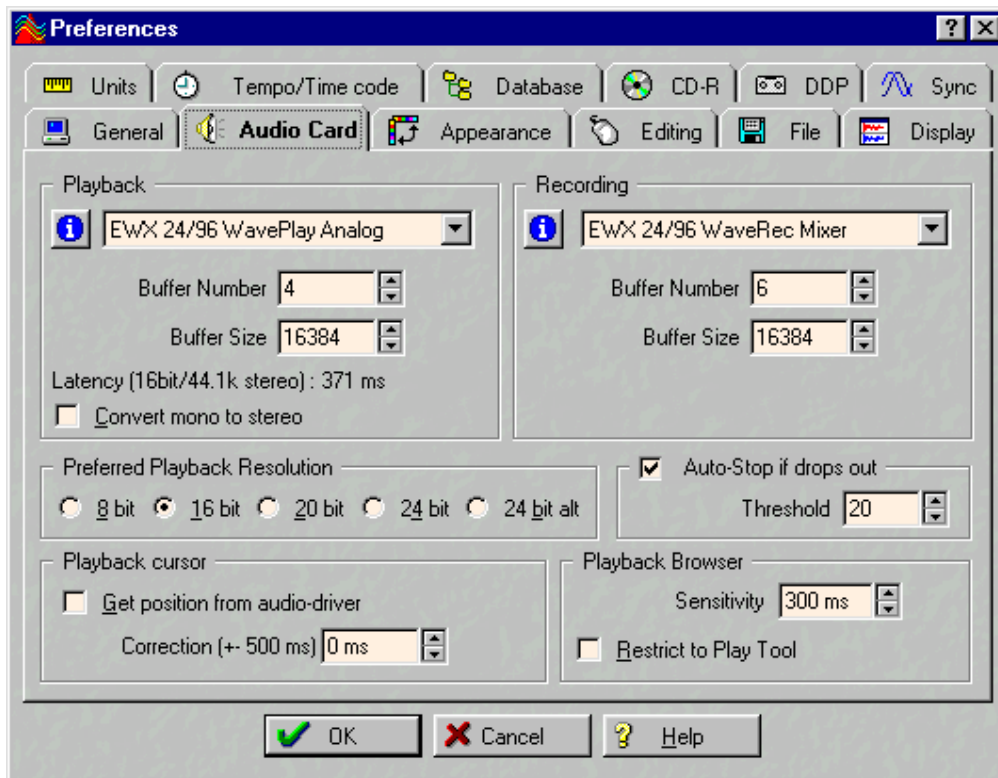
- Configure and steer the AudioSystem EWX 24/96,
- listen to all important (and a few unimportant) audio file formats
- edit recorded and imported audio data
- and “sequenzing” on a professional niveau and otherwise have fun.

You could say: complete. And the best of all: The program is powerful enough to give you professional features and options for all your needs. No fooling and (almost ...) no fluff. That, by the way, you find additionally on the AudioSystem EWX 24/96 CD. In the folder “HOTSTUFF” – which is a TerraTec tradition – we have gathered what we consider to be the best and most useful audio share- and freeware programs in order to give you enough stuff for hours of fun and practical tools to work with.

Now on to it: after the software installation you will find – assuming you have installed all components – the following programs, that we would like to present to you here in overview. You can find more detailed information in the respective software’s help files. Have fun!

The Drivers.

The AudioSystem EWX 24/96 offers you a whole range of somewhat different drivers to record and play audio material. All driver names start with “EWX 24/96” and end with a number in parenthesis. The drivers support all bit rates between 8 and 24 Bit and all common sample rates between 8 and 96 kHz. The sample rates are not “interpolated”, that means that the EWX 24/96 switches automatically to the sample rate that an application is currently using (a recording for example). This avoids loss in quality due to sample rate conversions.

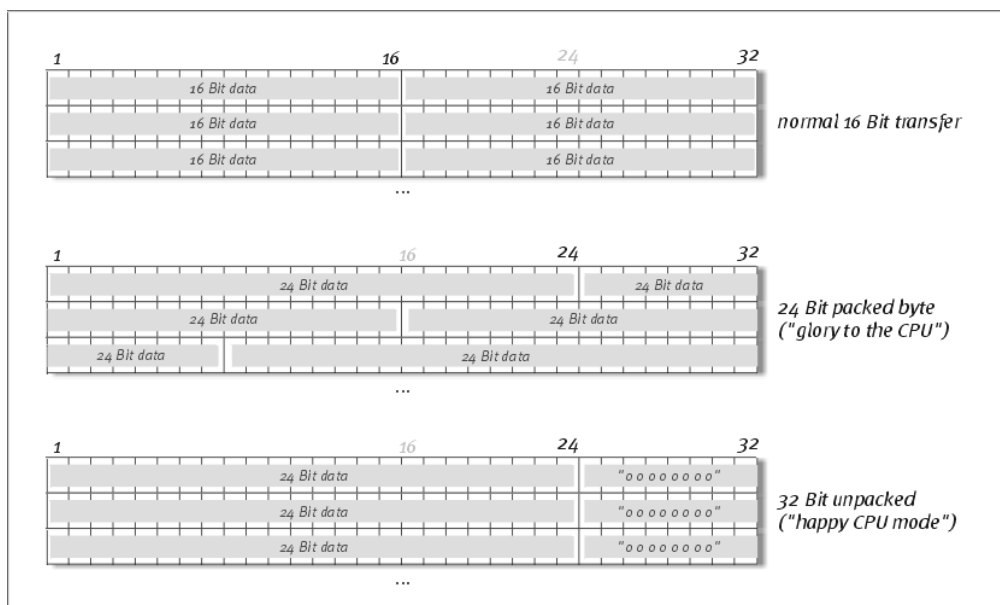


A view of the playback driver (e.g. Steinberg WaveLab).

The drivers support another, special data transport format, called “32 Bit unpacked”. For the curious: audio data streams are sent over the PCI bus to the main memory. The PCI bus operates on 32 “channels” (32 Bit). So a PC usually pays special attention that all of it’s resources get used for the task at hand, and so for the transport of 8 Bit audio files they are bundled into fours ($4 \times 8 = 32$), bei 16 Bit and 16 Bit data into bundles of two ($2 \times 16 = 32$) so that they can be sent along (diagram top).

With 24 bit audio material the situation becomes more complicated to process: all of a sudden there are “only” 24 harmonious bits there - then 8 are “missing” completely. The “24 Bit packed” method solves this in the following way: the CPU (lets say a Pentium) splits the 24 Bit stream into multiples of 32 (diagram middle). That costs power and doesn’t have to be.

Using the “32 Bit unpacked” method the rest of the 24 data-bits are filled with zeros by the hardware and sent by the driver as an appropriate 32 Bit packet. Most of the software on the market today supports this resource saving method (diagram bottom).



But now let's take a look at the individual drivers, the so-called "Devices".

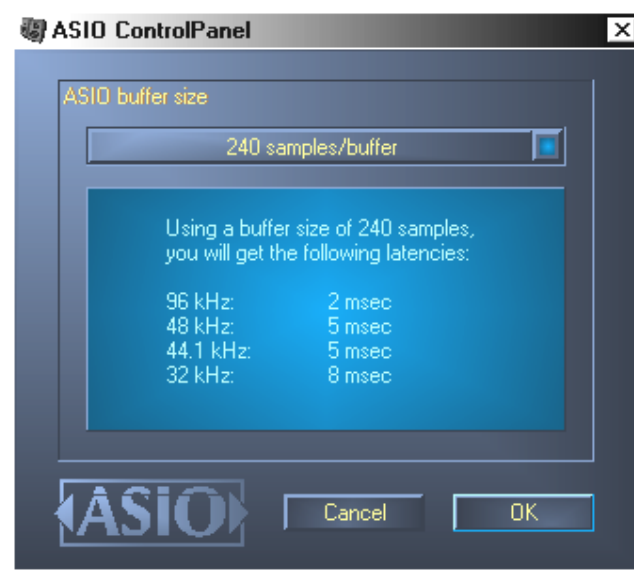
The Most Important: WavePlay and WaveRecord.

Really those worthy of first mention are the "EWX 24/96 WavePlay" device for audio playback and "EWX 24/96 WaveRec" which is responsible for recording. Both drivers exist in 2 versions – one for analog and again for digital recording and playback. Last but not least in this context, we present the recording driver "EWX 24/96 WaveRec Mixer". This driver, if you want, will record the sum of *all* the signals on the card. It can therefore be used for loss-free digital "resampling" of all driver sources.

All of the mentioned devices support two driver models: MME and DirectSound. Depending on the application you should choose the appropriate device for the best performance in the software being used.

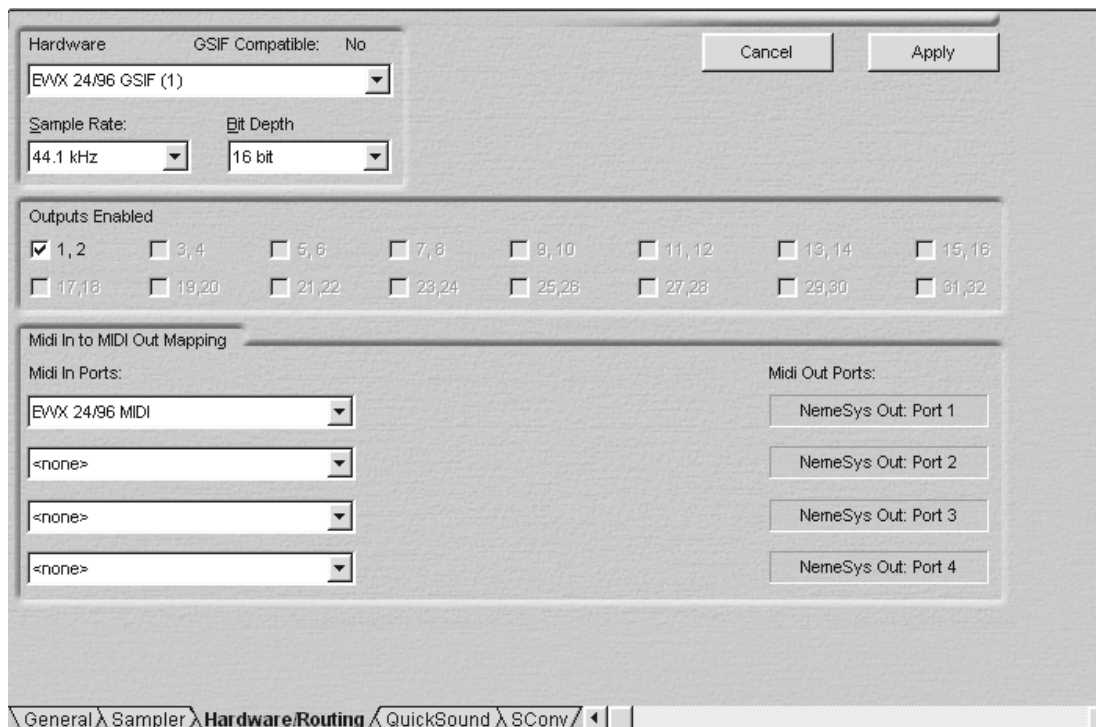
The ASIO Driver.

At a first glance invisible: the AudioSystem EWX 24/96 ASIO driver. Programs that use Steinberg's ASIO (e.g. ASIO 2.0) standard, reach (for Windows standard) extremely low delay times (latency) during recording/playback. Cubase VST as example should be able to achieve a latency from 7-20 ms. On a fast and cleanly installed system as little as 3 ms with a sample rate of 96 kHz is possible! The in- and outputs that are available in the various programs are here also called "EWX 24/96 WavePlay" and "EWX 24/96 WaveRecord".



The GSIF Driver.

Equally at a first glance hidden is the *GSIF driver* for the AudioSystem EWX 24/96. The sampler software GigaSampler (and other products from the producer Nemesys) can also access the hardware extremely fast and direct. The outputs in the different Nemesys programs available appear under the driver “EWX 24/96 GSIF” summarized.



The driver configuration in Nemesys GigaSampler

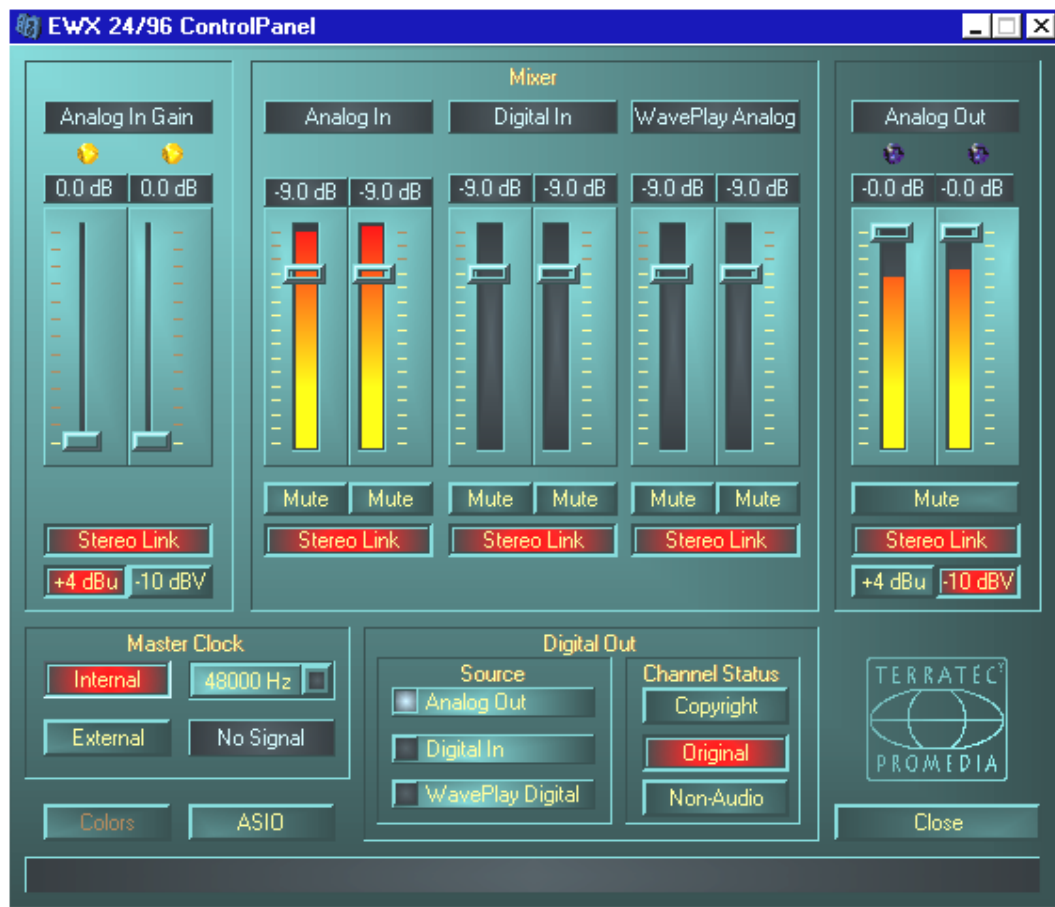
The MIDI Driver.

For the playback of MIDI information over the MIDI IN- and OUT ports there is a special driver at your disposal. You can select this system labelled “EWX 24/96 MIDI” driver anywhere it is applicable. The AudioSystem EWX 24/96 offers you one (1) MIDI in- and output driver, with which you have 16 MIDI channels total at your disposal.

Should MIDI files that are played through Windows also be sent to external devices, then open “Multimedia Properties” in Windows Control Panel and set the MIDI option to the above mentioned driver (also see the chapter “Driver Installation.” on page 11).

The EWX Control Panel.

The EWX Control Panel is - next to the drivers – by far the most important software in the package. Here you can, as the situation requires, take command of your EWX 24/96, switching and sliding, controlling the sensitivity and the volume.



How does the EWX Control Panel work?

The EWX Control Panel, or the routing (signal flow inside the card) of your EWX 24/96 is quite simple to understand. You have already been exposed to many of the possible settings in the capital concerning the card connections – therefore the following are only supplementary usage notes, let's go!

The Mixer Area (above).

The colorful light organ in the panel doesn't just bring pretty colors into play, but also serves primarily to help maintain a clean in- and output signal environment:

Above every pair of controllers you find the accompanying "responsibility" title. One controller commands and controls one signal -- overlapping (e.g. through different settings combinations) doesn't come into play.

The increasing or decreasing of signals can be achieved using the dB display above each controller. The "Analog In Gain" signal can be raised in 0,5 dB steps up to +18 dB. The other controllers allow you to lower a signal in 0,5 dB steps all the way down to -43,5 dB. The setting -45 dB activates a hardware driven "Gate" function, which can be compared to the mute functions. Note: this value (of "only" 45 dB) is actually quite sensible, because it a) allows the full available linear slider area to be used and b) a really applicable control is made possible. If you would like to sink the signal strength even further, you can achieve this in the software being used, which generally makes more sense.

Hover with the mouse over one of the colored VU meters, and the signal level appears in dB after a short time.

The mute switches are capable of stopping the signal from passing any further.

The stereo link function (active by default) makes the simultaneous control of both the left and right side of a signal possible.

In order to reserve your system resources you, the VU meter can be shut of with a simple right mouse click.

Analog In Gain and Analog Out additionally feature a multi-colored clip LED. This optical control simplifies the recognition of possible signal overload. If the signal strength rises between -1 dB and -3 dB then the yellow light warns you. Should the red light appear then you are clipping the signal because it has reached the limit (≥ -1 dB). You have found the right setting when the LED blinks yellow now and then.

The Settings (below).

The Master Clock.

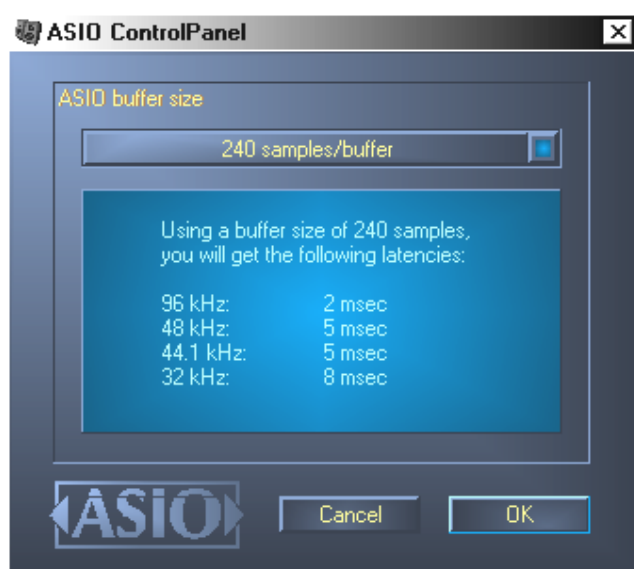
At this point we would like to discuss sample rates, with which you use your EWX 24/96. This is a very important point, because the card can be synchronized by other devices (**External**, e.g. a Minidisk recorder), or the value can be set (**Internal**) and forwarded to other devices. When a valid S/PDIF signal is sent to the digital input the sample rate is shown in the EWX Control Panel and the EWX 24/96 sample rate can be synched to the (**External**) signal.

Please note that when recording over the S/PDIF port, that the cards sample rate must match that of the sending device. To ensure an error free synchronization to the external device, set the **MasterClock** in the EWX Control Panel to “External”.



If you forget this step, then among other things, you will hear errors (drop-outs, popping) in your recordings as a result. And also vice versa (an external device should be synchronized with the EWX24/96) you need to make the corresponding settings to your peripheral devices. The EWX Control Panel then needs to be set (as is during operation without connected external devices) to “Internal”. If you have devices *permanently* connected in both directions then you have to decide which end should determine the synchronization.

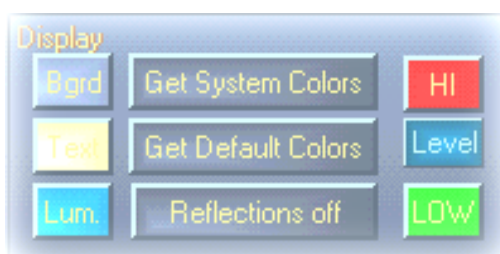
The ASIO Button.



The ASIO buffer size setting can be found behind the ASIO button. This setting is responsible for the “speed” of the ASIO driver. The smaller the number of samples per buffer, the less time passes before the software gives the ASIO supported signal out. Which values should be used depends on the system. In the most favorable case the software latency amounts to a mere 3 ms. On an average system with a CPU load common for a music

PC, a delay of 7-30 ms is realizable. Please note, that the ASIO application must be restarted in order to initialize any changes you have made in the settings.

Color- Coding the Display.



Probably the most important setting inside the EWX Control Panel is made here. Colors influence our lives, wherever we let our eyes wander. Life is beautiful, and with rose-colored buttons and a light green reflection every Windows desktop can be

brightened up a little with fresh pixel light. So fool around, have some fun with it! ;-)

PS: Humor aside – the “Reflections off” option turns the pretty show off and on. This can be helpful on slower systems. Under Windows 95 you may not even notice any color changes in some instances as special system files from Microsoft are being called on here.

“Get System Colors” uses the currently applied Windows color palette. Eventual presentation problems can be dealt with in this manner.

“Get Default Colors” resets the display colors back to the default settings.

People less enthusiastic to such colorful interfaces can rest assured: the system performance in “reflections off” mode is the same as in “normal” (gray) Windows element mode.

Digital Out.

Here you can make changes to the settings concerning signal flow and the S/PDIF data stream:

- **Analog Out** gives the same signal via S/PDIF, which is also routed to the analog output.
- **WavePlay Digital** offers the signal from software straight to the digital output.
- **Digital In** routes the digital input signal directly to the digital output.

All three of these settings offer the following parameter options:

- **Copyright** adds a copyright mark or (by deactivation) filters it out. Hereby is the so-called “Copy-Protection-Bit” set, which *doesn't* allow the signal to be copied on normal consumer devices.
- **Original** activates what is known as the “Generation-Bit” and only allows exactly *one* digital copy to be made. If you deactivate this function - if the bit is set to 0 – you are allowed to keep merrily making copies.
- **Non-Audio** adds information to the data stream that is recognized as “Non audio” and so transfers raw data formats (like AC-3 / DVD audio, and others) for playback.

The TerraTec Logo.

A click on the gently shimmering company logo informs you about the audio drivers and system settings. This information can be very useful if you ever have to contact our Customer Service department.

Close.

... or Alt+F4. Out. Over. Finished. The end. Finito.

The mixer symbol appears in the Windows tray (bottom right corner, near the clock) when the EWX Control Panel is loaded. Many function are directly accessible by right-clicking on the icon – please read the appropriate explanation in the section above.

About is equivalent to a click on the TerraTec logo.

Hide / Show minimizes or maximizes the EWX Control Panel.

Quit is the same as the “Close” function.

Source concerns itself with the digital signal flow settings.

GigaSampler LE.

Adding just the right touch to your AudioSystem EWX 24/96 sound is without a doubt achievable - take a look at the “GigaSampler” from Nemesys. This software turns your system into a full value sampler with support for countless sounds in GIG, WAV and AKAI format! Also in the packet: the MegaPiano – one of the best "digital pianos" on the planet. What makes it so special: the sounds are played directly from the hard drive. That way the sampler's memory capacity is immense.

A detailed explanation of the software can be found in the accompanying online documentation.

WaveLab Lite.

Steinberg's repeatedly and highly acclaimed sample editor WaveLab is especially suited for editing and recording large audio files. Even recording in 24 Bit / 96 kHz format is no problem for this software. Precise Zoom functions and plenty of tools for fast editing round up your AudioSystem software excellently.

As WaveLab will probably show itself to be your most used program, here's a fast run through up to your own first recording:

- Start the program.
- Open the "Options" menu, choose "Preferences" and switch to the settings menu for the Soundcard (You can also push CTRL+P).
- Select a playback and record driver from the EWX 24/96: analog or digital for your desired source.
- Close this dialog with "OK".
- Push the red recording button or the " x " on the number keyboard (top right next to the minus key) to open the recording dialog.
- Choose the sample rate you want (this must correspond with the card setting, look in the EWX Control Panel) and bit rate and start your recording.
- Recording to the hard drive will continue until you choose to end it or the system reports the drive is full.
- Afterwards you can edit and save your new file.

A more in-depth description of the software can be found in the accompanying online documentation.

MusicMatch Jukebox.

Just as every new programmer starts his first program with "Hello World", every soundcard traditionally comes with a media player. :-) The MusicMatch Jukebox is more though – and for that reason included in the TerraTec packet: it allows you, besides playback support for many audio file formats, to digitally extract audio CD's. The program can, if desired, write the files, with title information in MP3, format directly to the hard drive - and uses the "original" Fraunhofer Codec for the best MP3 quality there is.

A detailed explanation of the software can be found in the accompanying online documentation.

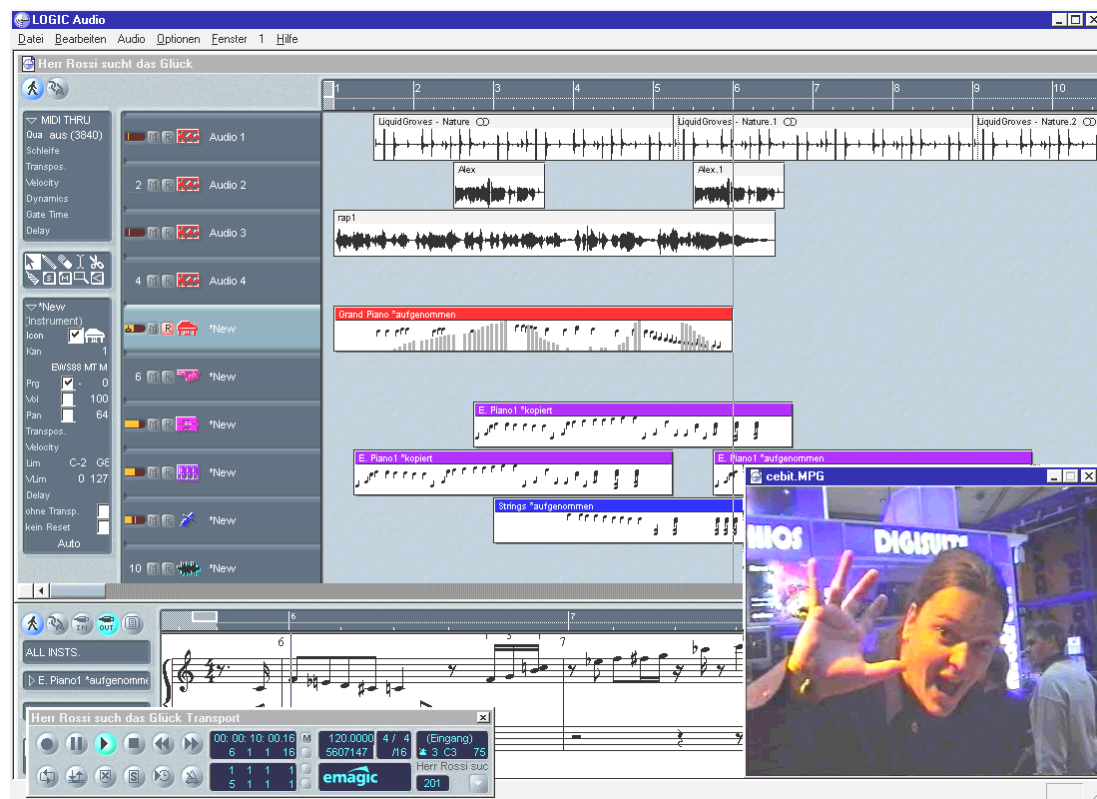
FruityLoops Express.

Harvest a really quick-ripening software sound crop from FruityLoops Express: this extremely intuitive, easy to use compositions tool allows you to arrange your sound clips and build them into complex rhythms and uses the fast DirectX-Driver from the EWX 24/96. Additionally there are diverse real-time effects and support for DirectX plug-ins. And on top of all that: a perfectly integrated software synthesizer (TS-404)! Through the Playlist Editor complete songs can be created and exported in WAV file format.

Emagic MicroLogic Fun.

In our packet we also have the pleasure to present you with Emagics Logic, one of the most successful audio/MIDI sequencers, and in the updated version even more powerful. And for the few who don't yet know about this widely used software: Logic allows you to record and comfortably edit MIDI and audio files. Logic offers, among others a note-display, diverse MIDI and audio editors as well as being able create a soundtrack for video. Especially in the audio field you can await a few extras from MicroLogic AV, like for example the complete support for recording, real-time effects and steering in 24 Bit/96 kHz.

New in this version, by the way, is the EWX 24/96 ASIO driver support, as well as the possibility to use the "Logic Audio Device Setup" manager to create your own driver combinations for MicroLogic.



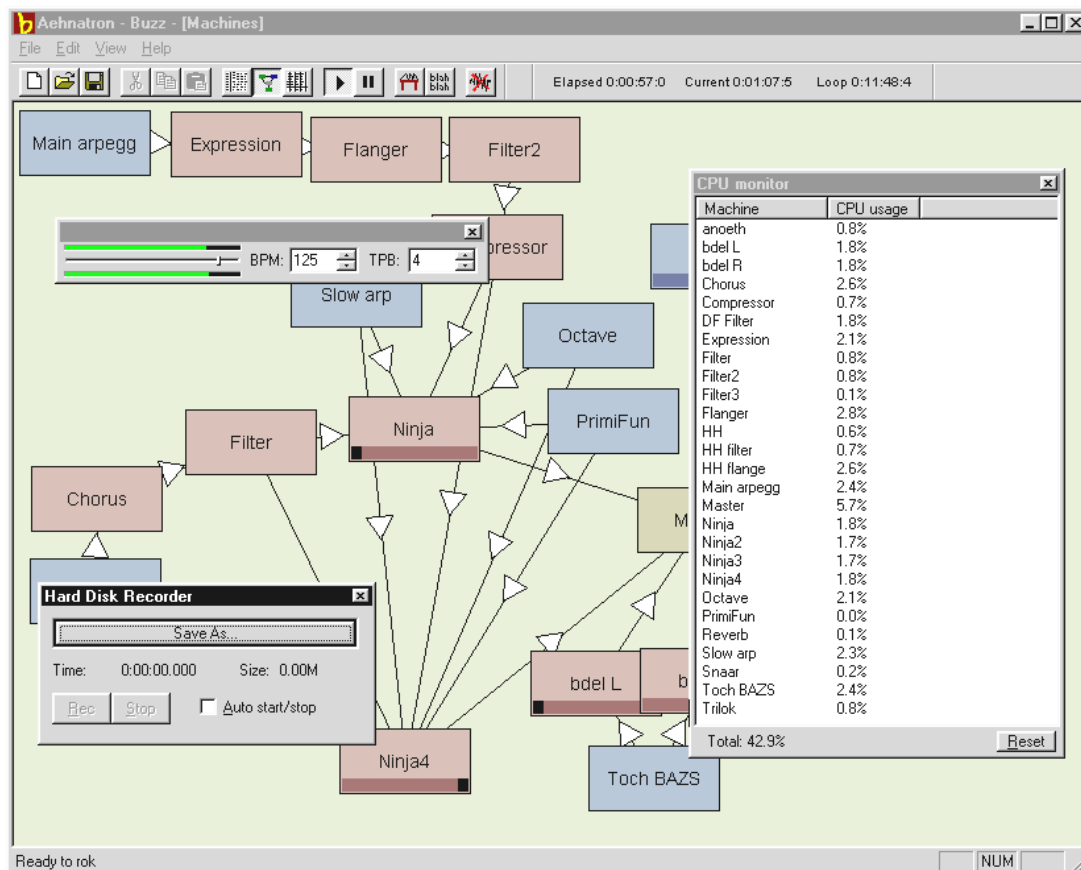
A more in-depth description of how to use the MicroLogic Fun software can be found in the accompanying online documentation. The original handbook from Emagic can furthermore be printed out – the documentation is found on the EWX 24/96 CD in PDF format for the Acrobat Reader.

“There once was a time, when music was made by hand... :-)”

BuzZ – ThE tRaCker.

“A freeware toy - with this card?! What is that supposed to be?!” ... you might ask yourself. However, we have decided to include this software addition because it's free – as in free. On the other side we want to introduce it to you because it doesn't really have anything to do with the traditional cliché about freeware sound tools. Our “Freaky Interaction and Work Enjoyment” department has selected to give you BUZZ, a full-blooded musician with a good sense of harmony and teacher of this somewhat other way to create sound and music – beyond the common sequencer models.

BUZZ takes you back to the roots of computer supported popular music – with modern optimised code for use in Windows. BUZZ is a music program that resembles the layout and steering common to the so-called “Trackers” of the mid 80's – like the Commodore AMIGA, and later under DOS PC's. In BUZZ music is “programmed”, which at first glance appears worse than it actually is: you choose an instrument (here: “generator”) and program “patterns”. A pattern consists of a string of 1 or more notes. These patterns are then arranged in a track list to compose a complete song (arrangement).



A special feature of BUZZ: the patterns aren't only notes - steering information for the instrument is also included. And these instruments don't have to be simple "WAV" players; there can be physical modelling/models, virtual analog synthesizers, effects and a lot more. There is also the option to route external sources as well as VST plug-ins into the signal. In other words: this thing is super – and that can't be measured by its price ;-).

BUZZ lives on due to it's own open programming code, which allows other developers to create their own generators and extras. The internet is clearly the best medium for dissemination of information (and songs and generators and and and ...). Once you've gotten a taste of BUZZ then you'll want to check out the many BUZZ pages on the web, for example:

english	www.buzz2.com
english	welcome.to/buzzards/
english	buzz.lotek.org/
german	www.terratec.net/panorama

If you like BUZZ, you can take part in the development of this broad-based project. How to do that can be found on the following Internet page

<http://www.fh-zwickau.de/~maz/products/german/index.html> (below).

There is no handbook in the sense of the word. But as a seasoned (or newborn?) freak you wouldn't want to read one anyway ;-). The TerraTec team has included a German language tutorial. The file TUTORIAL DEUTSCH.BMX can be opened with BUZZ. Simply push the F10 button in the program.

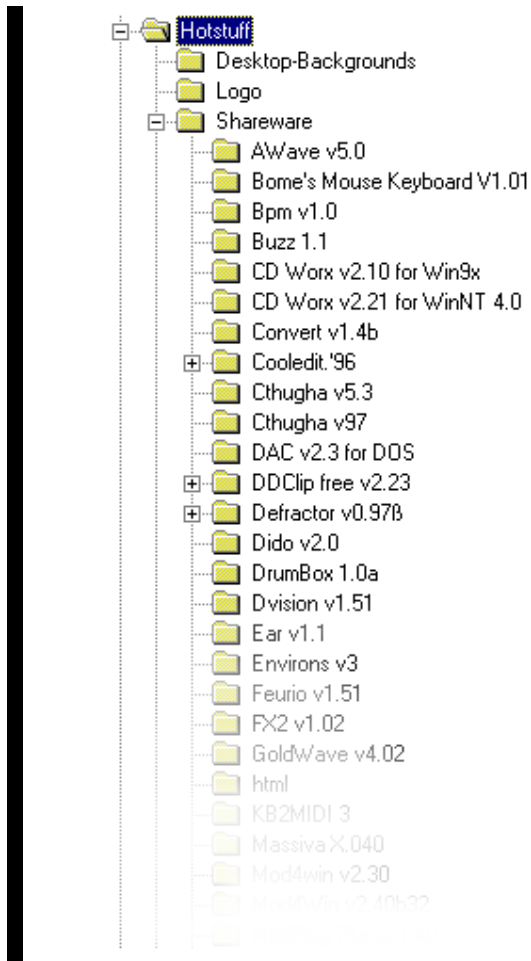
Note.

BUZZ is a pretty freaky tool. As freeware it exists thanks to its many thousands of fans worldwide. BUZZ is not (and hopefully never will be) “finished”, that means, the software is permanently in the development phase. It can cause errors and crashes, or create frequencies that are ugly and even hurt. The TerraTec team offers **no support** and takes no responsibility for BUZZ – the use of this program must be taken at your own risk but adds to your sense of self-confidence, knowing you have accomplished something. Every “BUZZer” has been down this path – because it's worth it. Make it so. ;-)



The HOTSTUFF Directory.

On the CD-ROM for the AudioSystem EWX 24/96 we have collected together a large number of other programs, tools and files. It's well worth a look.



Many of the programs we present here are shareware. Please support the shareware principle and pay the amount that the authors ask if you like the programs. Thank you.

Tips and Valuable Information.

About Hard-drives and Necessary Space.

So now we have a new recording device with which we can suddenly realize a higher quality than was previously possible. Naturally there is – like with most good things in life – a hitch: as quickly as the quality rises, the necessary drive space increases correspondingly. You should therefore keep in mind; by your 24 Bit recording you'll need an appropriately large and fast drive.

To get a general idea what amount of data your drive has to be able to handle in order to maintain such a high standard of quality, here is a small easy formula you can use to factor the average requirements.

*Desired number of tracks x resolution in BIT x sample rate in Hz divided by 8 divided by 1024
and divided again by 1024 = MB/s*

So a stereo track (that's 2 tracks) at the highest resolution is expressed with the following equation in Megabytes per second:

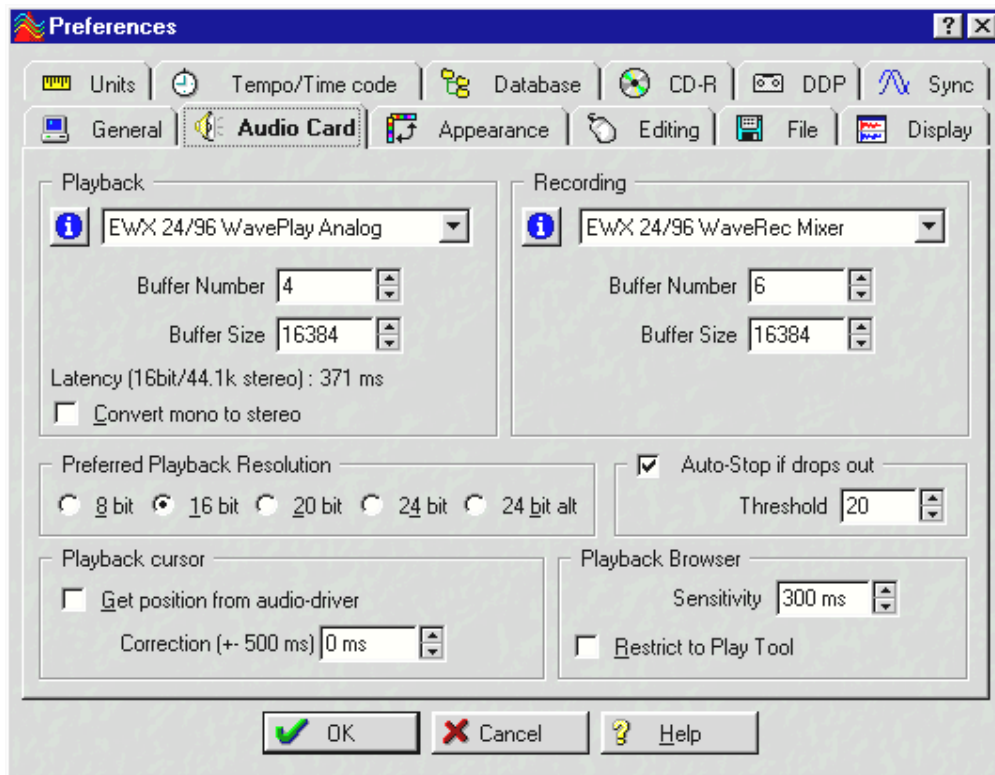
$$2 \times 24 \times 96000 / 8 / 1024 / 1024 = \sim 0,55$$

With a little over a half a MB per second the hard drive requirement reaches 33 MB in one minute.

It gets really interesting when you start to think about the *data transfer* involved in a multi-track recording: with 8 tracks then according to the figures you're going to need 2,2 MB per second. For a "normal" arrangement with about 20 tracks (wherefrom we'll say 16 are played simultaneously) then you can count on needing to handle around 5 MB per second. And we are obviously only dealing with playback here.

Of course we're not trying to talk you out of using the high resolution. You should consider however, depending on the song and the situation you may want to demand less from the workload of your system. In many cases the difference between 48 kHz and 96 kHz isn't really such a major factor. "Give it everything ya got!" doesn't always have to be. ;-)

The DMA Buffer Transfer Latency.



In some programs, besides the usual choices of drivers, you will be confronted with the buffer size. What may appear at first somewhat complicated, later reveals itself as very useful, once you understand what it all means – and it's not really all that difficult.

The number and size of the audio buffers determines just how fast an application (e.g. a software synthesizer) can access the Windows driver. The fewer the buffers and the smaller their size, the faster the card can react. You can see it for example, if you wiggle the controllers in a software synthesizer while it's playing or move the positioning marker in a hard-drive recording program during the playback.

The faster the better, they say, if it just didn't have a limitation: which values should be used depends on the system - and on a slow PC – “fast” values leave their mark - as skips and hops during playback and recording. So pay attention for “drop-outs”, and raise the values if you have to.

Differing Sample Rates / SR Conversion.

The AudioSystem EWX 24/96 utilizes *no* sample rate converter. This typical soundcard component normally ensures that signals in different sample rates can be played together, because the sample rates are all “interpolated” to one frequency.

To describe the function of a sample rate converter here is an example (please note: the following scenario is not possible with your card): A soundcard is synched from a DAT recorder at 48kHz (external). With an audio editor you are working on a file with a frequency of 44.1 kHz. While you're listening to this file to test it Windows registers some action with a system sound (22.05 kHz). All of these sample rates "resound" at the same time, and with 48 kHz – the frequency set externally. Everything sounds normal, although the audio files aren't really being played at their own frequencies. Actually though, you can hear a difference if you listen closely. That's because the sample rate converter alters the files in real-time. The quality suffers as a result of this admittedly practical converter – as good as it may be.

With the AudioSystem EWX 24/96 we are not dealing with a normal soundcard in its common form, and this shouldn't freak you out. Don't be shocked should it prove to be the case that half of your songs are "accidentally" (as this comes into practice very often) recorded with an *interpolated* sample rate. We have therefore decided against integrating a sample rate converter. Instead the sample rate is dynamically synched to the appropriate data flow that's being used. Without even so much as a tiny loss in quality – just like it is in professional systems. But beware: if you try to play multiple files with various sample rates at the same time you will receive an error message.

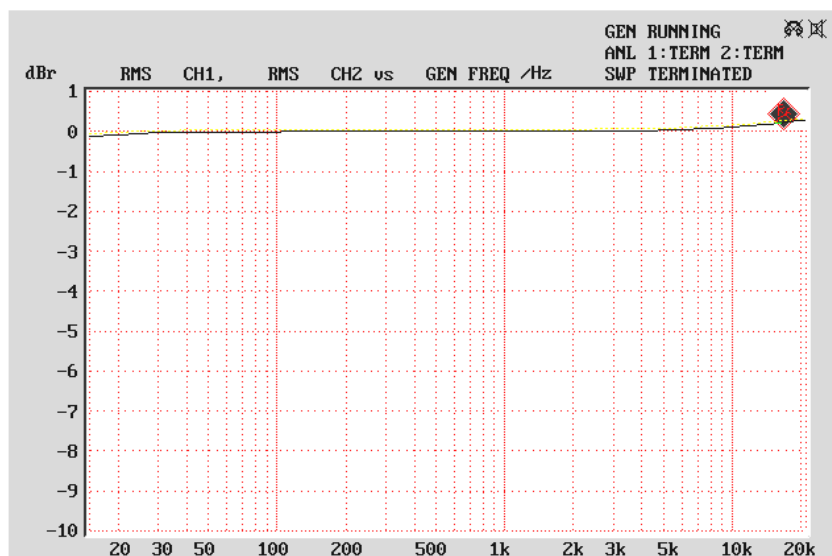
Appendix.

FAQ – Frequently Asked Questions and their Answers.

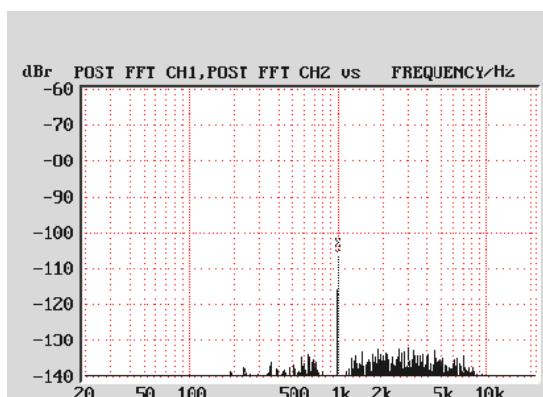
A FAQ (Frequently Asked Questions) list to help solve potential problems can be found on the installation CD and in the Internet @: **www.terratec.de/support**.



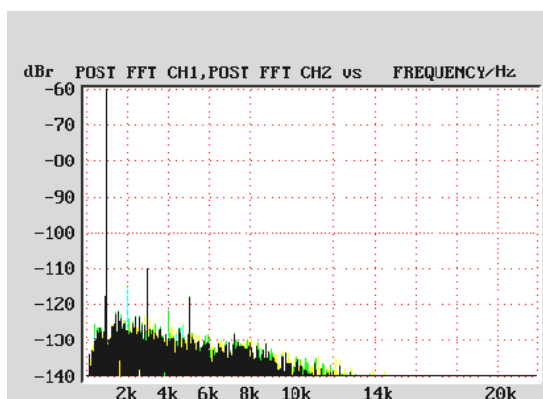
EWX 24/96 Technical Specifications.



Frequency Response



Dynamic Range



THD + Noise