SoundSystem

DMX 6fire 24/96

High Resolution DVD/Games/Music

English Manual

Version 26.11.01

CE Declaration

We:

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

hereby declare that the product:

SoundSystem DMX 6fire 24/96

to which this declaration refers is in compliance with the following standards or standardizing documents:

1. EN 55022 Class B

2. EN 55024

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

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

This declaration is based on:

Test report(s) of the EMC testing laboratory

Contents

Welcome!

We're pleased that you have chosen a TerraTec SoundSystem and would like to congratulate you on this decision. You've purchased a sophisticated product representing the state of the art of audio technology, and we're convinced that our product will prove extremely useful to you in the coming years and provide you with a great deal of entertainment.

This manual covers the SoundSystem DMX 6fire 24/96 and its uses in great detail. But first, here's a quick overview:

SoundSystem DMX 6fire 24/96 – PCI card with front module

A broad range of connections. The SoundSystem DMX 6fire 24/96 is the result of our many years of experience in the PC audio sector and reflects the continuous evolution of audio and multimedia software for the PC. The SoundSystem DMX 6fire 24/96 offers you a wide range of interconnection options with other audio devices such as hifi surround systems, turntables, MiniDisc or CD players with analog or digital outputs, headphones and microphones. For convenient access – and a visual highlight, of course – install the front module in your PC.

Quality audio. The SoundSystem DMX 6fire 24/96 provides extremely high quality for analog recording and playback of analog material. The card features modern 24-bit converter components with a sample rate of up to 96 kHz. As a result, the DMX 6fire 24/96 achieves a S/N ratio of well over -100 dB(A) on its analog inputs and outputs!

Recording and playback of audio material at the purely digital level. The SoundSystem DMX 6fire 24/96 features one optical and one coaxial stereo input and output each in 24-bit S/PDIF

format. You can therefore transfer already digitized recordings from a CD, DAT or MiniDisc player (or recorder) to the PC without losses. You can also choose from all commonly-used sample rates and access settings related to copy protection and generation bit. The interface even supports the transfer of raw data such as Dolby AC3 signals.

Software à la carte. You'll soon to come to appreciate the ControlPanel of your DMX 6fire 24/96. ––Its carefully thought-out user interface and intuitive control of all card settings will make your day-to-day work with the SoundSystem a breeze.

The selection of drivers leaves nothing to be desired. Our sophisticated driver architecture based on Microsoft's WDM technology guarantees the trouble-free deployment of the card in all modern Microsoft Windows operating systems. Musicians will also be pleased by its support for Steinberg's ASIO 2.0 interface, as well as WDM kernel streaming (e.g. Sonar™) for extremely low latency times, permitting software instruments to be played live.

And last but not least, we've included a number of software titles that will assist and entertain you. All programs were selected after extensive practical testing and the personal experience of our staff as valuable additions to round out your SoundSystem for a wide variety of applications.

We hope you enjoy your work with the SoundSystem DMX 6fire 24/96 and would like to suggest that you browse this hopefully entertaining manual when you get the chance. In addition to the most vital information on the technology, we've outlined a number of typical applications wherever appropriate. We're convinced that even experienced users will profit from this guide. **Don't miss** the remarks in the margins marked with an exclamation point. They contain information such as summaries of the following sections, notes on important settings or tricks that can make your day-to-day audio work significantly easier.

Thanks for your attention - enjoy!

...your TerraTec Team

Multiple audio cards in a single system.

Multiple DMX 6fire 24/96 SoundSystems can be installed in a single computer and used simultaneously. The SoundSystem can also be used parallel to cards of the TerraTec AudioSystem EWS and EWX series; EWS®-Connect is not available for the internal synchronization of the cards, however.

Using the DMX 6fire 24/96 together with existing sound cards from other manufacturers generally does not pose any problems under Microsoft Windows operating systems.

Connecting front modules/extensions.

Musicians will be pleased to hear that they can connect the optionally available microWAVE PC synthesizer module, as well as other "DigitalXtensions" to the PCI card – and take advantage of their full functionality. **However, please note: Only one (1) module may be connected to the PCI card.** Do not connect additional modules to the CN6 or CN10 connectors if you would like to use the module included in the package. This may damage the card and module(s) – and this is NOT COVERED BY THE WARRANTY!

When using the microWAVE PC, you can take advantage of the full functionality of the front module. Both MIDI ports are available, the internal wavetable connector can be used, and even the headphone output is available. The digital interfaces cannot be used with a sample rate of more than 48 kHz due to hardware restrictions, however. AC3/DTS output is also not available, since the interfaces are designed for S/PDIF signals. The DSP of the Waldorf synthesizer can only be clocked at 32, 44.1 or 48 kHz.

From opening the package to installation.

Before installing the sound card in your computer, please note the details of your computer's configuration. Also refer to the handbook of your computer and other expansion cards for their settings.

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

If difficulties arise nevertheless, please reread the relevant chapter in this handbook carefully.

Please call our service hotline if you are still having problems. The phone numbers and hours of the hotline can be found in the Appendix of this documentation.

Start by making sure that nothing is missing.

The SoundSystem DMX 6fire 24/96 package should contain the following items:

- 1 TerraTec SoundSystem DMX 6fire 24/96 PCI sound card
- 1 DX6F front module
- 1 flat ribbon cable to connect the PCI card and the front module
- 1 CD-ROM digital audio connector cable
- 2 adapter plugs, 6.3 mm stereo jack to 3.5 mm socket
- 1 installation and driver CD
- 1 manual
- 1 customer service card
- 1 TerraTec registration card with the serial number
- 1 Algorithmix registration and update card

Please 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.

Note! Even if you're a seasoned pro, you should still at least skim the "Software" chapter starting on page 29. The information on drivers and the first sections on the ControlPanel are important for your overall understanding of the system. Thank you.

Short and to the point for busy pros.

The SoundSystem DMX 6fire 24/96 is a PCI card with busmastering support. Please choose a slot which is far away from the graphics card(s) or SCSI/RAID controllers – i.e. as far close to the "bottom" as possible in most installations. Also be sure to leave room for up to four audio cables that can be connected to the card.

The front module is connected to the card using the included flat conductor cable. This cable also supplies the front module with power. If possible, please install the module in a bay below the CD, ZIP drive or other devices due to the dangling cables.

You will need 1 IRQ. Installing multiple DMX 6fire 24/96 cards is no problem – the cards will run in IRQ-sharing mode.

You will also need a number of free address ranges (generally no problem).

The driver installation under Windows (98SE to XP) follows the Microsoft guidelines. The drivers can be found on the included CD-ROM.

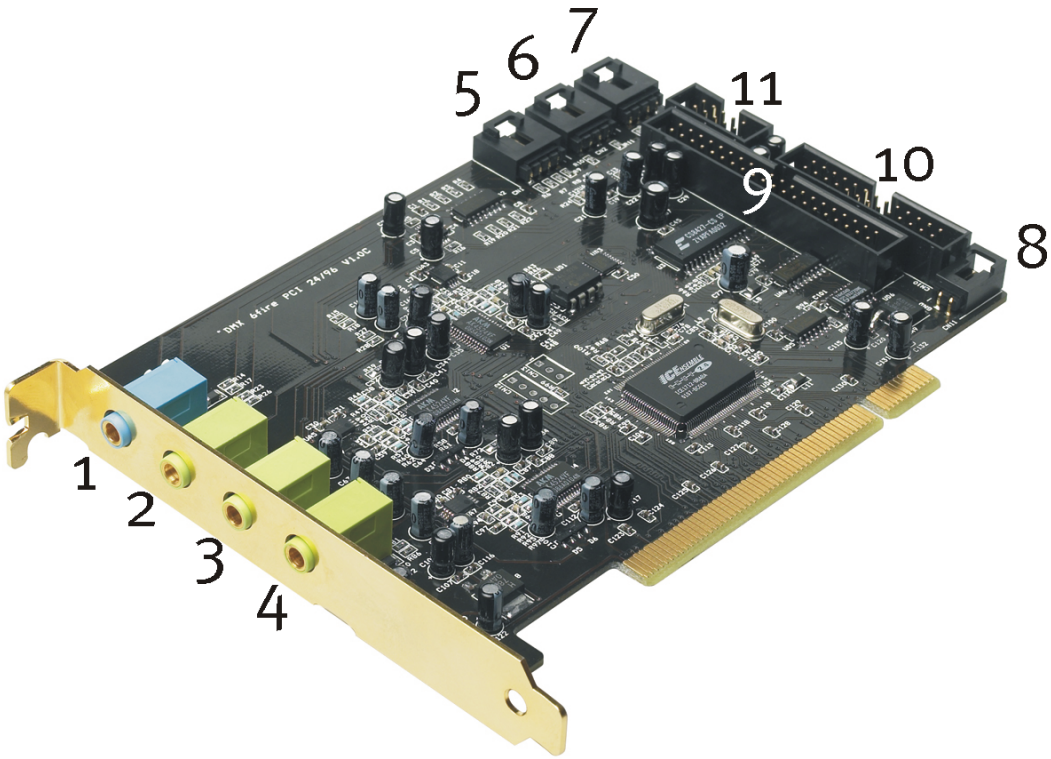
After installing the drivers, open the Device Manager and check for yellow exclamation marks. If you find any, please see the Appendix (page 52) for our suggested solutions.

The software installation will begin automatically once the drivers have been installed. You **must** install the ControlPanel. The full functionality of the SoundSystem cannot be controlled using the Windows Mixer.

The WDM audio drivers can be selected in the applications as usual. ASIO drivers are available in compatible programs; WDM kernel streaming is "not visible" (i.e. it is always available for applications and cannot be selected explicitly). The respective buffer sizes can be configured in the **DMX ControlPanel** (not to be confused with the Windows Control Panel).

So much for the summary. The following is a detailed, illustrated description of the installation.

The connectors of the DMX 6fire 24/96 PCI card



1. Analog stereo audio input (3.5 mm jack)
2. Analog stereo audio output "Front" (3.5 mm jack)
3. Analog stereo audio output "Rear" (3.5 mm jack)
4. Analog stereo audio output "Center-LFE", Left = Center, Right = LFE/Subwoofer (for 3.5 mm mini-jack)
5. Onboard audio input (AUX, stereo)
6. Onboard CD-audio input 2 (stereo)
7. Onboard CD-audio input 1 (stereo)
8. Onboard CD-ROM digital audio input (TTL)
9. Multipin connector for included front module
10. Multipin connector for optional DigitalXtension F (DXF), DigitalXtension R (DXR) and DigitalXtension microWAVE PC (digital line)
11. Multipin connector for optional DigitalXtension F (DXF) and DigitalXtension micro-WAVE PC (analog line)

Note: The front module belonging to the SoundSystem DMX 6fire 24/96 cannot be used together with other modules! Do not connect other modules to CN6 and CN10 if you intend to use the included module. This may damage the card and module!

The connections of the front module.

1. Stereo audio input (RCA, with signal LED) for line devices such as cassette decks
2. Stereo audio input (RCA) for turntables with moving-magnet (MM, MD) pickups
3. Stereo analog output (RCA) for line devices, e.g. cassette decks
4. Mono microphone input (for 6.3 mm jack, adjustable gain; with peak LED)
5. Stereo headphone output (adjustable volume/level)
6. Digital audio input (coaxial, S/PDIF/AC3/DTS)
7. Digital audio output (coaxial, S/PDIF/AC3/DTS)
8. Digital audio input (optical, S/PDIF/AC3/DTS)
9. Digital audio output (optical, S/PDIF/AC3/DTS)
10. Input for external MIDI devices (5-pin, DIN)
11. Output for external MIDI devices (5-pin, DIN)

On the rear: Connection for flat conductor cable to PCI card

Installation - step by step.

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

- Switch off your PC and all connected peripheral devices such as your printer and monitor. Leave the AC cable 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 socket.
- Remove the cover from the case of your PC.

Installing the PCI card.

- Look for a free PCI expansion slot, remove the screw holding the slot blanking plate (if present) and remove the plate. Should it be necessary to break a plate out of the case, do so with great care to avoid injury.
- To ensure the optimal function of your SoundSystem, look for an expansion slot that is not immediately next to an already-installed card. Some cards, such as video or SCSI/RAID adapters, can send out signals which can interfere with the sound card.
  We also recommend a slot as close to the bottom of the computer as possible, as you can connect up to 4 audio cables directly to the card itself. Due to certain physical properties of our planet, it is very likely that these cables will dangle downward. ;-)
- First remove the flat conductor cable, then the PCI card from its packaging. 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 completely discharged (no joke) via your computer without affecting the card.Please do not touch the components of the card.
- Connect the flat conductor cable to the only suitable connector on the card. Connect any other required internal cables (e.g. to the CD drive) to the card. For further information on the various connections, please see page 9.
- Align the audio card so that the strip with the golden connector pins is located exactly over the PCI slot.
  Insert the card into the slot. You might have to press the card firmly into the slot to make good contact. Take care to ensure that the contacts are precisely in line in order to avoid damaging the audio card or the motherboard in your PC.
- Secure the card with the screw from the slot blanking plate (these screws are generally also included with PC cases).

Installing the front module.

- Find a free 5¼" bay on the front of your PC. If possible, please install the module in a bay below the CD, ZIP drive or other devices due to the dangling cables. It may be necessary to break out the cover plate. Do this with great care to avoid injury.
- Take the loose end of the flat conductor cable that you connected to the PCI card earlier and thread it from the inside of the PC through the open bay so that it extends out of the PC case. Connect the plug to the connectors on the rear of the module.
- Slide the module into the bay and secure it with the included screws. Make sure that it is installed solidly, as the frequent plugging and unplugging of cables places higher mechanical loads on the module than those that act on a CD drive.

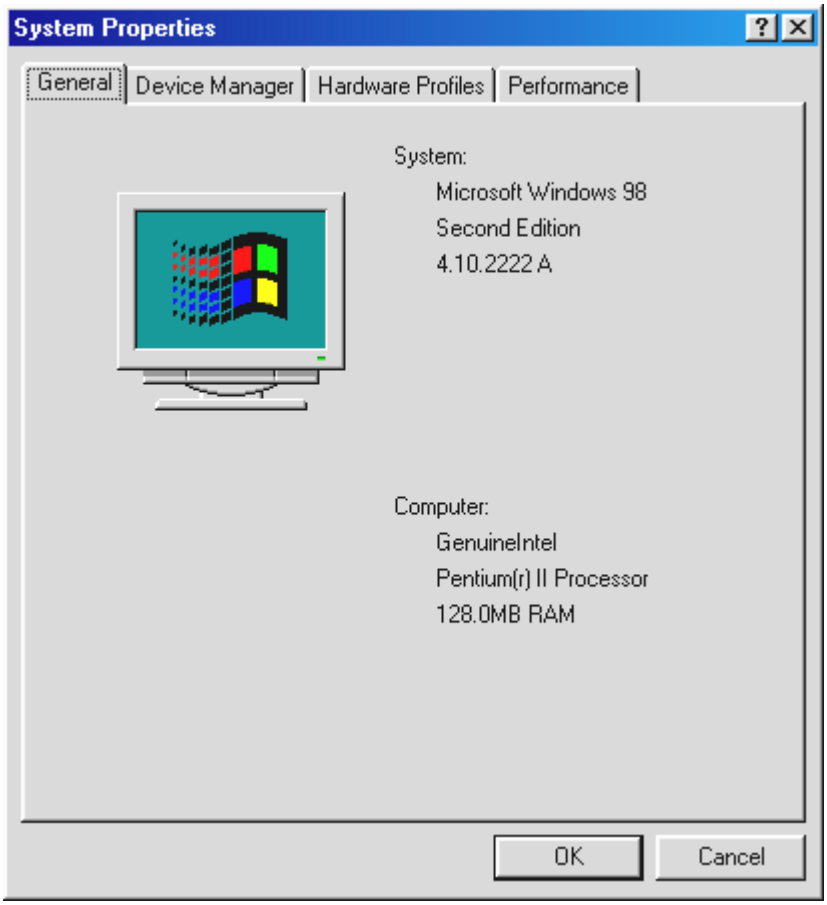
Finishing up.

- Reinstall the cover of your PC case.
- Connect your audio peripherals (hifi amp, active speakers, mixer, etc.) to the DMX 6fire 24/96. (also see chapter "The connections and their uses." starting on page 25).
- Reconnect the AC power cable as well as all other cables and turn your PC on. Make sure that your speakers or hifi system is set to low volume.
- Start your computer. The installation of the driver software is the next step.

Installing the driver software.

The SoundSystem DMX 6fire 24/96 is currently supplied with drivers for the Windows 98 SE, Windows ME, Windows 2000 and Windows XP operating systems. The card cannot be used under Windows 95 and Windows NT 4. You should therefore determine which operating system you are using before installing the card.

For information on your operating system and its version number, please check the ***System*** dialog in the Windows Control Panel.

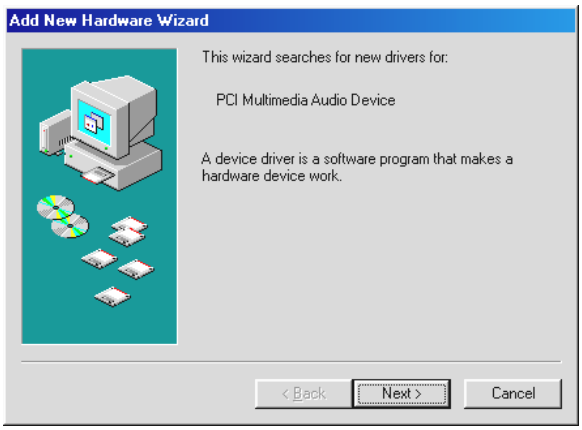


For example, this is how you recognize Windows98 SE.

In the following description of the driver installation **<CD>** stands for the drive letter that Windows has assigned your CD drive where the DMX 6fire 24/96 CD is.

Installation under Windows 98 SE.

Once you have installed the SoundSystem DMX 6fire 24/96 card in your PC, Windows 98SE recognizes the card as a new hardware component and displays the following screen.

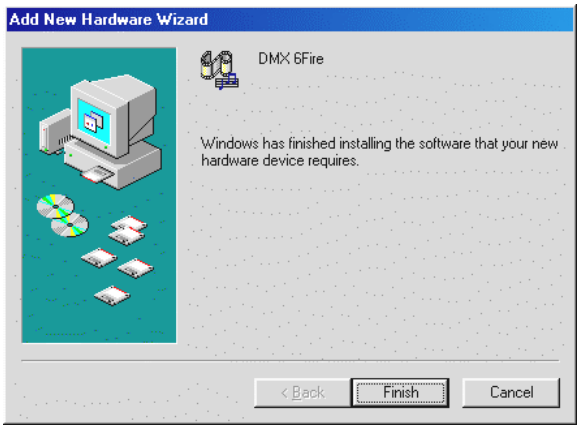


Click "Next".

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

Enter the path ***<CD>:\Driver_ControlPanel\Driver*** *and then click on "OK". Alternatively, you can select the path to the DMX 6fire 24/96 per mouse by clicking on "Browse...".*

You should also click "Next" when this screen is reached.



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.

Should Windows again ask for driver files point to the same path on the DMX 6fire 24/96 CD-ROM 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 the driver has been successfully installed, it is easy to add the other bundle software via the autostarter.

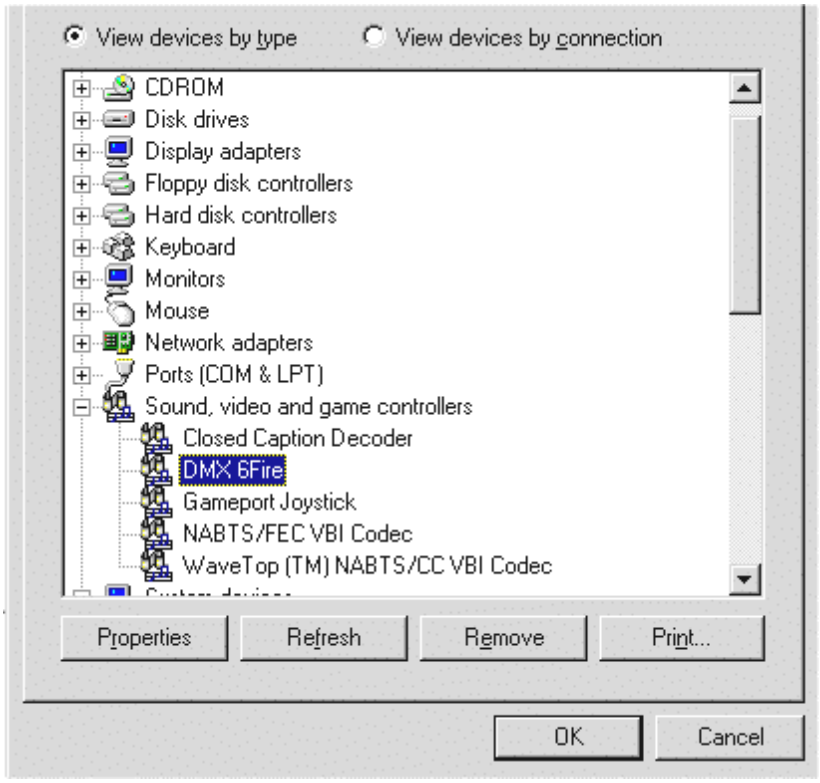
<CD>:\autorun.exe

Follow the instructions on the screen. There shouldn't be any problems.

The accompanying bundle software can be removed as simply as well. 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.

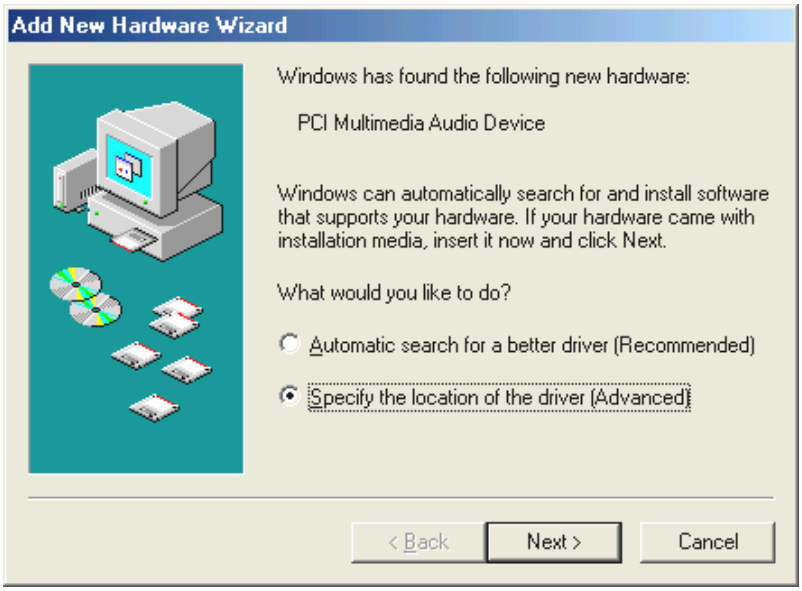
After the driver has been successfully installed, you should verify that everything is configured properly with your Windows 98 SE system. In the Device Manager you can check the status of recognized or installed hardware components. The Device Manager is found in the Windows Control Panel under "System".



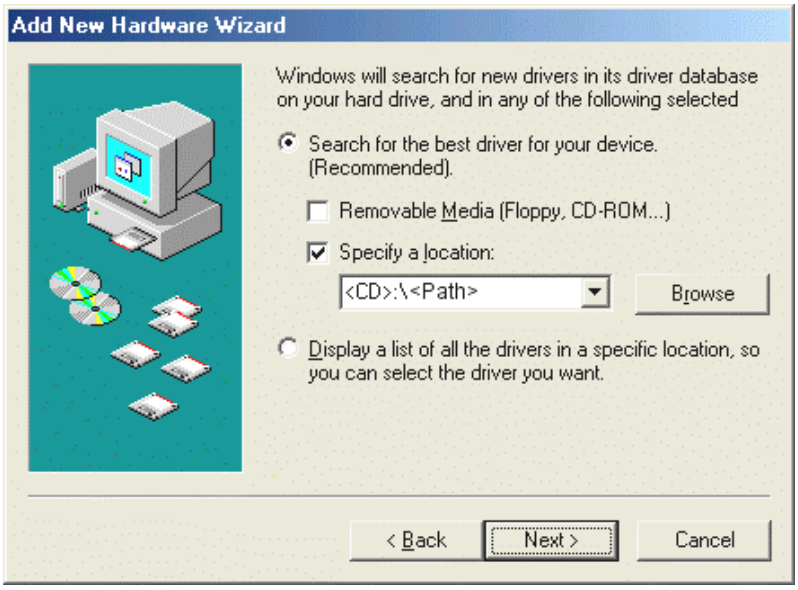
This is how the window should look if everything has been installed properly. In the picture, the item "Sound, video and game controllers" is opened. You can do this by clicking the small "+" symbol on the left hand side.

Installation under Windows ME.

After the computer has restarted and the new hardware has been found by the Windows hardware wizard the following window is displayed.

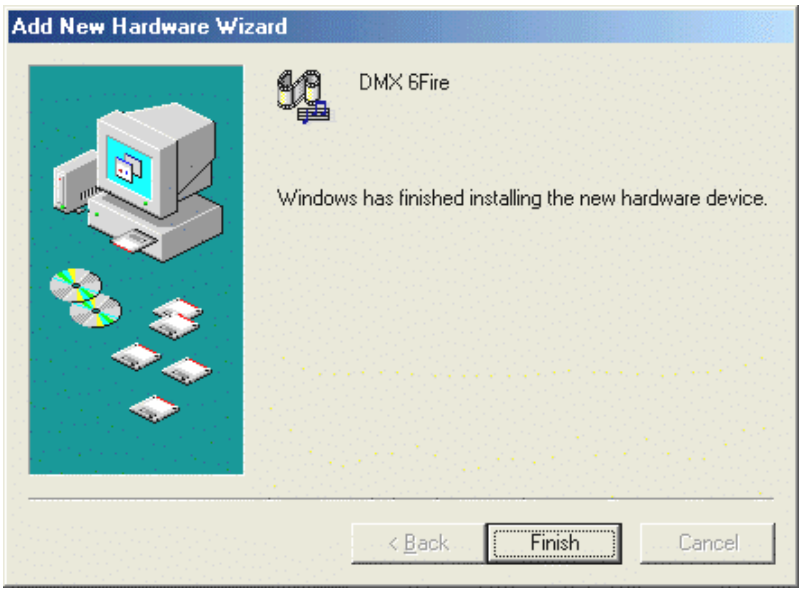


Choose "Specify the location of the driver (Advanced)" and click on "Next".



Check the box "Specify a location:", enter the path ***<CD>:\Driver_ControPanel\Driver*** *and click on "Next". Alternatively, you can select the path by clicking on "Browse".*

You should also click "Next" when this screen is reached.



To complete the installation click "Finish".

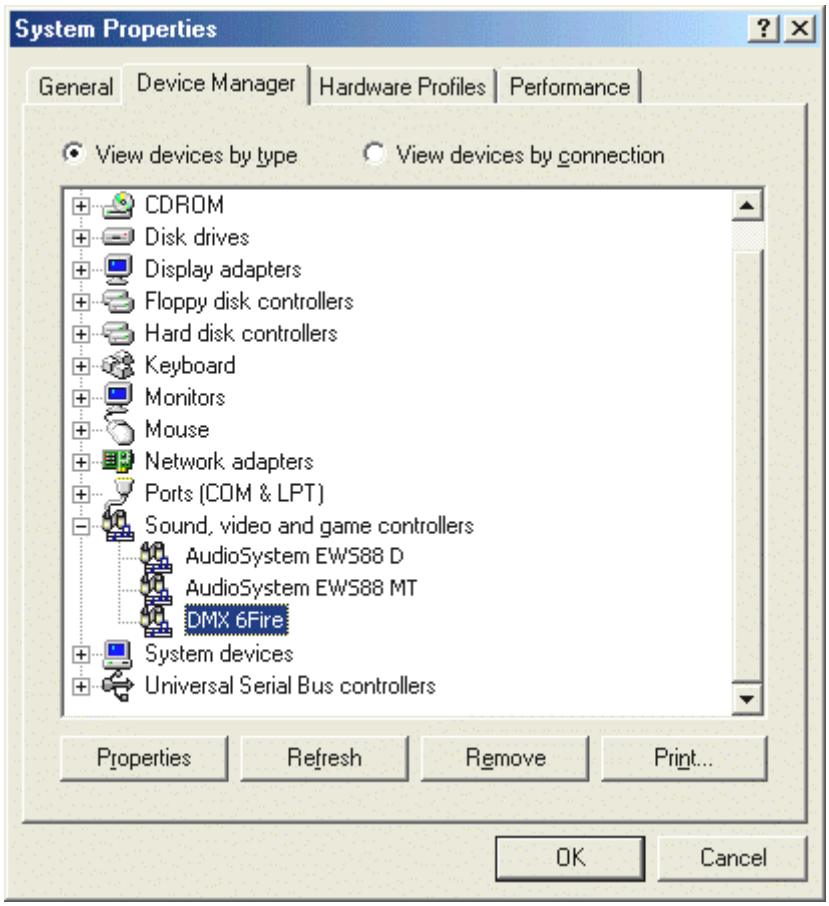
After the driver has been successfully installed, it is easy to add the other bundle software via the autostarter.

<CD>:\autorun.exe

Follow the instructions on the screen. There shouldn't be any problems.
The accompanying bundle software can be removed as simply as well. 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.

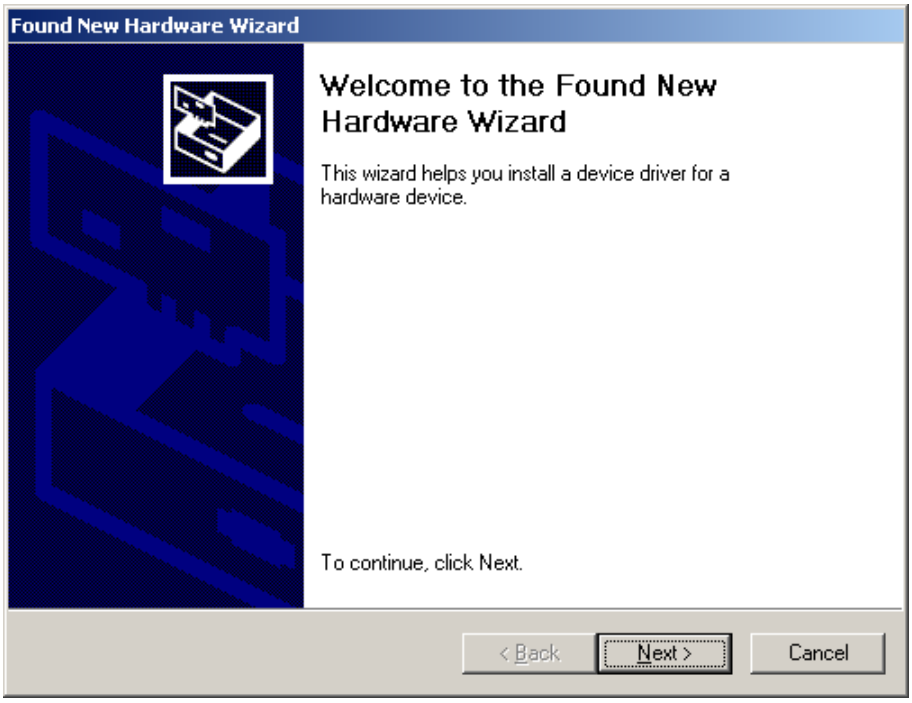
After the driver has been successfully installed, you should verify that everything is configured properly with your Windows ME system. In the Device Manager you can check the status of recognized or installed hardware components. The Device Manager is found in the Windows Control Panel under "System" › "Hardware". Then click on the "Device Manager..." button.



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

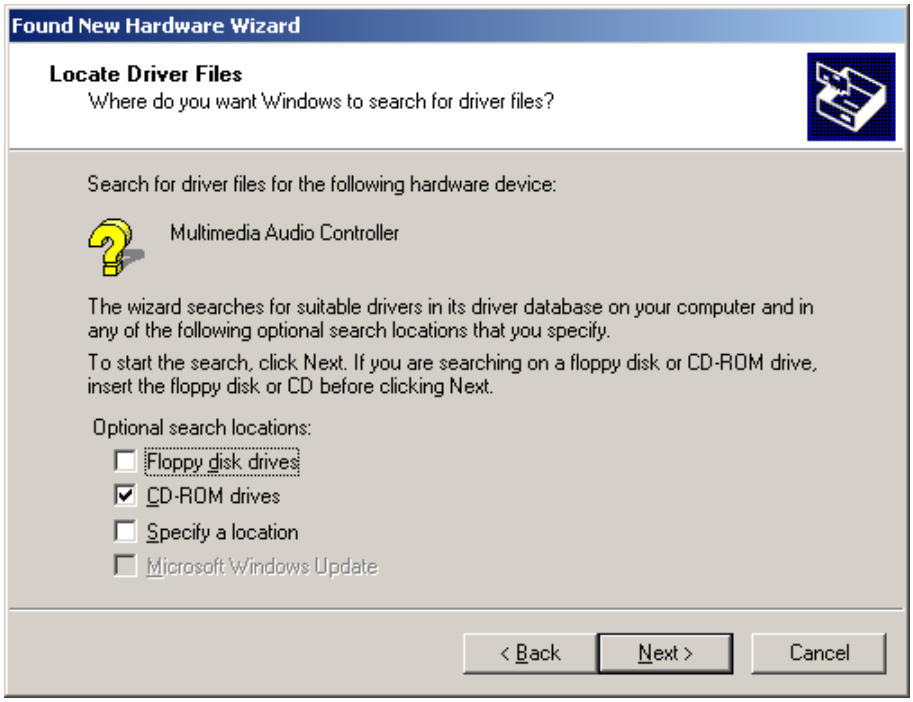
Installation under Windows 2000.

After the computer has restarted and the new hardware has been found by the Windows 2000 hardware wizard the following window is displayed.

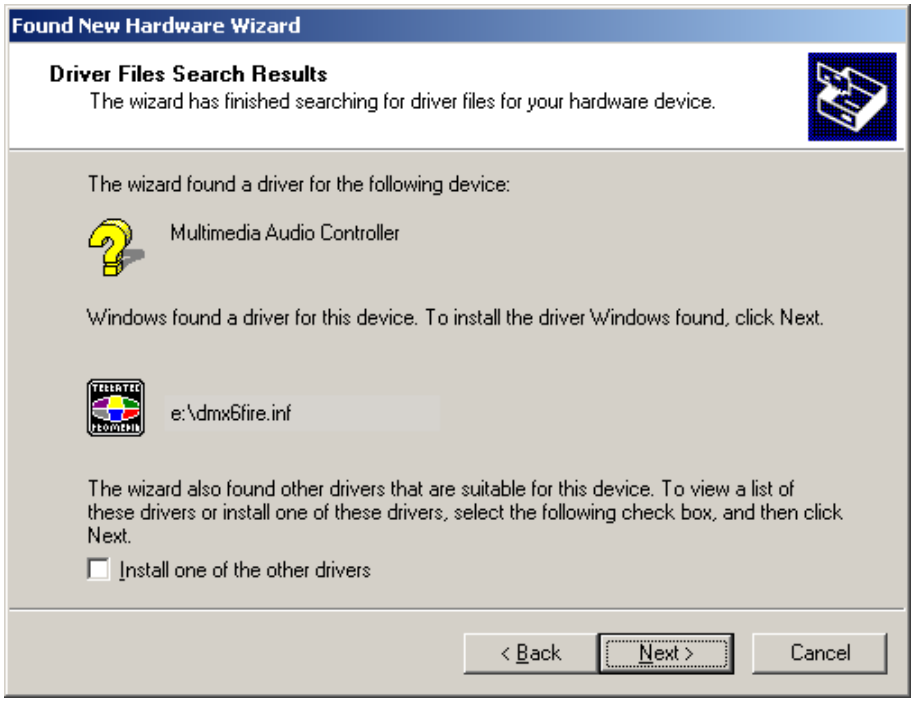


Click "Next".

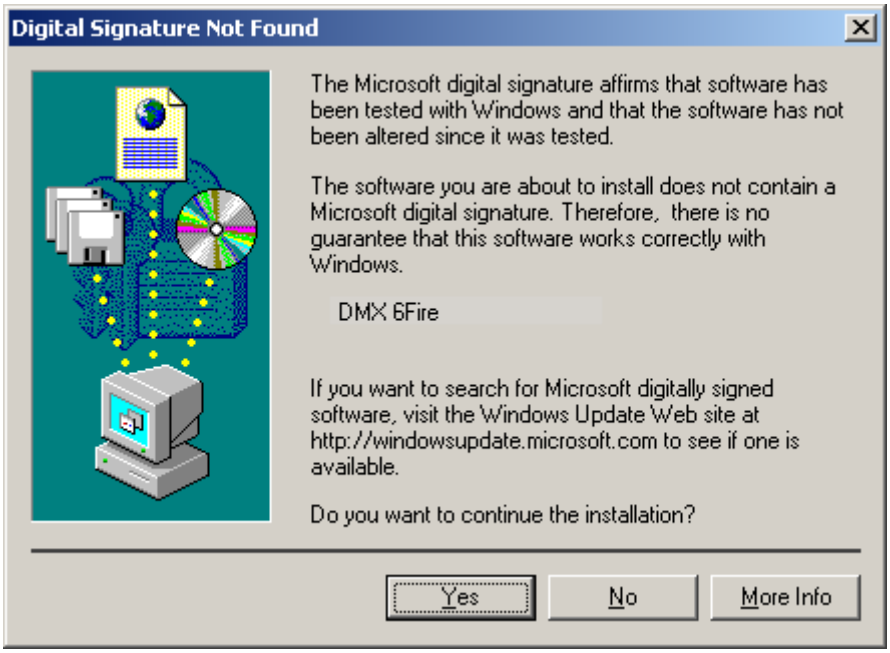
Choose "Search for a suitable driver for my device (recommended)" and click "Next".



Select the "CD-ROM drives" check box and click "Next".



You should also click "Next" when this screen is reached.



Proceed with the installation by clicking "Yes" .

Later in the course of the installation, a window of this kind may appear again, stay calm and collected and proceed carefully by clicking "YES".

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.

Should Windows again ask for driver files point to the same path on the DMX 6fire 24/96 CD-ROM 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.

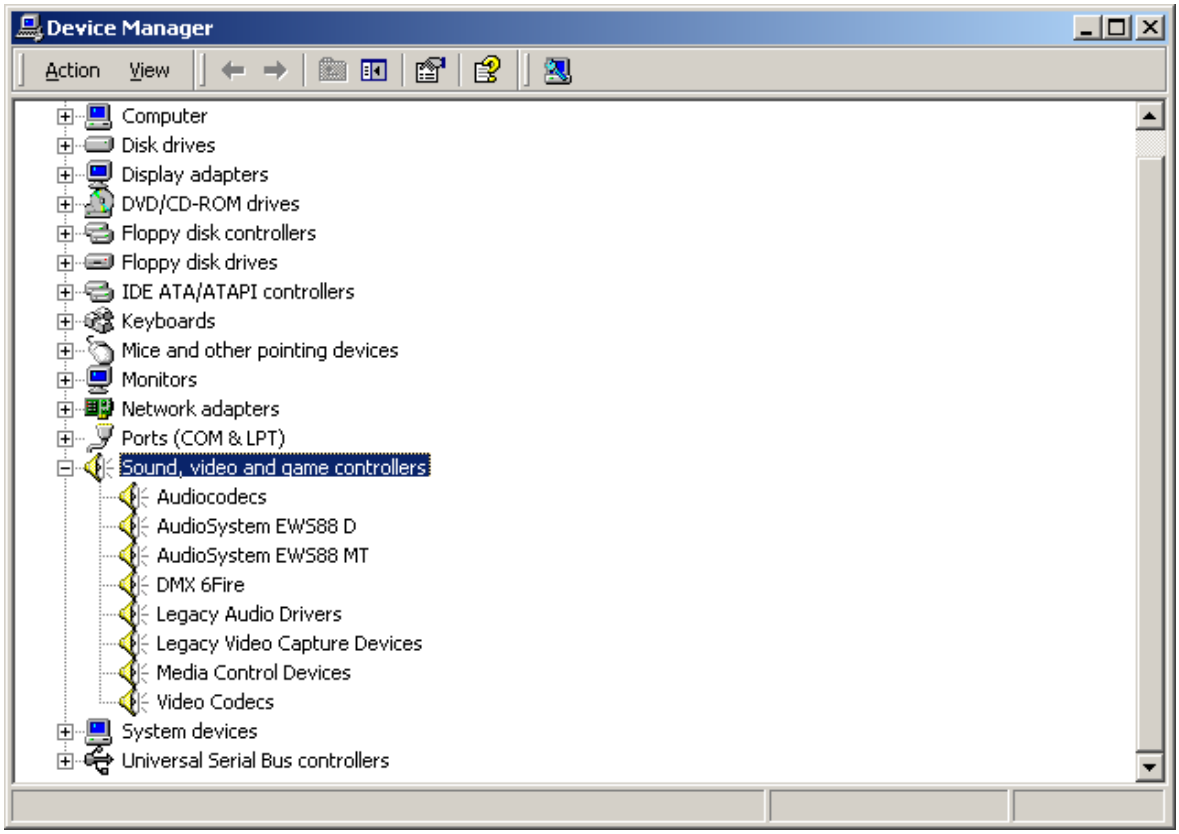
After the driver has been successfully installed, it is easy to add the other bundle software via the autostarter.

<CD>:\autorun.exe

Follow the instructions on the screen. There shouldn't be any problems. The accompanying bundle software can be removed as simply as well. 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 2000 system. In the Device Manager you can check the status of recognized or installed hardware components. The Device Manager is found in the Windows Control Panel under "System" › "Hardware". Then click on the "Device Manager..." button.

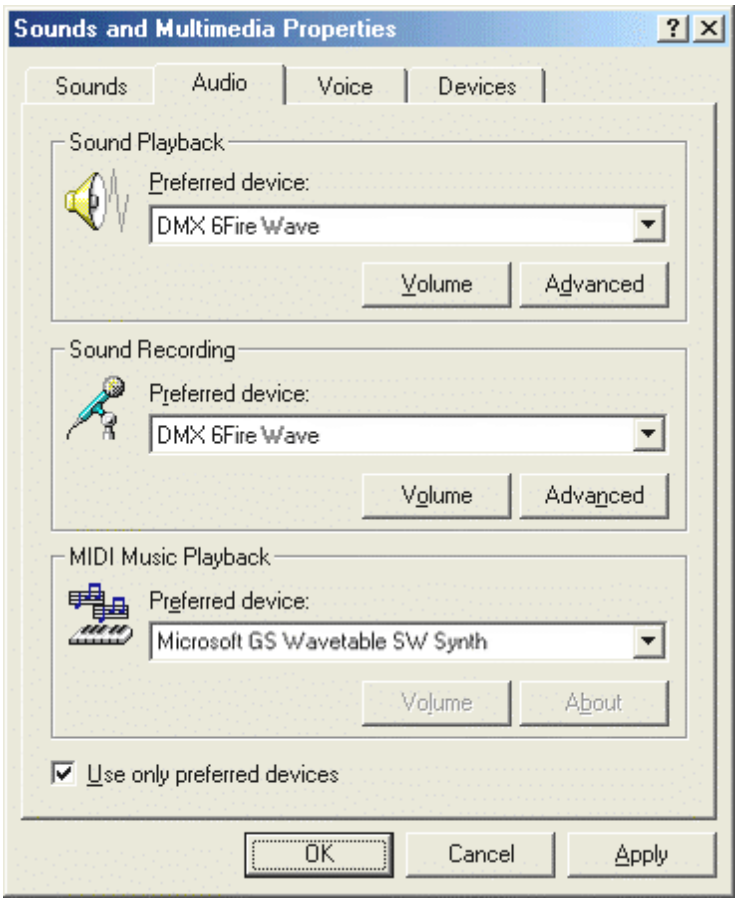


This is how the window should look if everything has been installed properly. In the picture, the item "Sound, video and game controllers" is opened. You can do this by clicking the small "+" symbol on the left hand side.

Multimedia settings.

Finally, check your system's "Multimedia" settings and ensure that the playback of audio data via the Windows Wave Mapper is correctly set up.

Open the ***Sounds and Multimedia Properties*** and select ***AUDIO***.



The output via the Wave Mapper is preferable for many programs and for the output of Windows system sounds.

A device may also be selected for the playback of MIDI music files. The Microsoft Wavetable Synthesizer is selected for this by default. If you have installed a different DirectX software synthesizer or a MIDI interface, select it here. If you would like output via the MIDI interfaces of the front module of your DMX 6fire 24/96, please select the “DMX 6fire MIDI”.

The settings in the dialog above apply to many games, the Windows system sounds, the Microsoft MediaPlayer, applications in the Internet Explorer (Flash, etc.), and so on. Please note that the driver settings must be configured separately in a number of programs. These settings will then override the ones made above. For further information on the individual drivers, continue on page 30.

The connections and their uses.

Now that you have successfully installed your new sound card, we now come to the most important part – connecting external devices and configuring the software.

Safety note.
When connecting analog devices, ensure that the power is off to protect your speakers and your hearing from sudden peaks. For digital devices, be sure to at least reduce the volume of your playback equipment.

Overview.

The SoundSystem DMX 6fire 24/96 offers a wealth of connection options on both the PCI card and the front module. We would like to introduce them to you briefly below:

Internally – CD Audio, AUX and TTL. The PC board of the DMX 6fire 24/96 features three plug connectors for analog connections to CD-ROM drives (CD1 and CD2), or other cards such as TV or video expansion modules (AUX). The required cables and plugs are standardized and are generally included with branded products.

An internal digital input is also available. An external S/PDIF signal with a so-called TTL level (+5 V), as provided by most CD-ROM drives, can be applied to the connector marked CN11.

The analog CD-ROM connections are electrically independent (decoupled) and can be used simultaneously. The DMX ControlPanel software represents both CD signals as a single source, however.

From the rear – 6 out, 2 in. Four sockets reside on the golden slot plate of your SoundSystem, each waiting for a 3.5 mm stereo mini-jack. The first three (green; F, R, C/W) are the outputs for six independent audio channels and are designed for use with a suitable (surround) amplifier or an active speaker system. Naturally, a mixer can also be connected to these outputs for studio applications.

The outputs are laid out in the format that you probably already know from 5.1 hifi applications:

F for the two front speakers (Front, Left and Right)

R for the two rear speakers (Rear, Left and Right)

C/W for the center speaker (mono) and the subwoofer signal, the so-called LFE channel (also mono). The left channel hereof is the Center signal (usually a white or black plug on the cable).

Another note: the output for the front speakers (F) is switched in parallel to the analog and (usually) digital stereo output pairs, as well as the headphone output on the front module. More about that later.

What remains is the blue socket (IN) on the slot plate – one of the card's many audio inputs. A signal applied to this input can later be selected for recording in the DMX ControlPanel.

From the front – total versatility.

The front module illustrates the flexibility with which the SoundSystem will meet all of your future audio and music recording and playback requirements. One at a time, from left to right:

The front module and its many connections.

Line In/Tape

The left (top) and right input is designed for recording from sources with a normal, so-called line level. The sensitivity corresponds to that of the input on the slot plate of the PCI card. This is the input for connecting devices such as cassette and tape decks, mixers, dictaphones, studio effects devices, the record output of your hifi system, etc. The small LED indicates whether this input has been activated in the DMX ControlPanel.

Phono

The left (top) and right inputs are designed for recordings from turntables without an intermediate preamp - without a doubt one of the highlights of the SoundSystem. You can plug your vinyl player directly into the front module thanks to its integrated phono preamp, and the system also handles the necessary filtering. The included software also contains a wide range of functions for the optimization of old audio material – more on this in the chapter “Connecting and recording from a turntable.”. Please ensure that your turntable uses a moving-magnet (MM, MD) pickup system. The hardware of the DMX 6fire 24/96 is not optimized for the less-common moving-coil (MC) systems. If you would like to use an MC system nevertheless, please ensure that it generates a minimum output voltage of 2-3 mV (please refer to the documentation of the pickup system).

Tip: to eliminate AC hum, connect the ground wire of the turntable to the case of your PC. Simply connect it to one of the retaining screws of the case's cover.

Line Out

This is the direct route out of the card in two channels (stereo; top = left). A normal line level is also available here, which also corresponds to the signal available at socket F (front) on the slot plate.

Mic In with gain

This is the microphone input of the SoundSystem DMX 6fire 24/96. Capacitor microphones with large jacks (6.3 mm) can be plugged in here. The gain control above the socket controls the sensitivity of the integrated microphone preamplifier. Use one of the included adapters if you would like to connect a microphone with a small 3.5 mm jack, for example a headset, to this input. Please note: the so-called 48 V phantom power supplies occasionally used in the professional audio sector can **not** be used with this module.

Headphone with level

This is the system's headphone output. It provides a stereo signal which is also available at the Line Out described above, as well as at the front socket. You can adjust the volume to suit your individual preferences with the control marked Level.

Digital coaxial

The pair of RCA sockets are the digital inputs and outputs (Digital In and Digital Out) of the system. The output complies with the S/PDIF standard; an AC3 or DTS signal can also be transferred. A variety of additional information can be added to the signal or filtered out during recording (or when looping a signal through the system). Copper coaxial cables with double shielding (similar to antenna or network cables) should be used on this interface. For more information, see page 49.

Digital optical

Another digital interface is available in addition to the electrical (coaxial) type. The functions of the TOS-Link socket pair correspond to those of the coaxial sockets. An optical fiber cable (optical waveguide) is used here to connect digital equipment (many MiniDisc players use this connection type). For more information, see page 49.

MIDI In and Out. Last but not least: MIDI devices can also be connected directly to the 5-pin DIN connectors without the need for adapter cables. A tip for beginners: MIDI cables are always "crossed" – Out to In, and In to Out.

The wavetable connection.

The front module also contains an expansion socket: the connector with 26 small pins is designed for the wavetable modules that you may remember from "way back when". TerraTec had a number of these supplementary modules in its product range under the "WaveSystem" name back in the mid-90s. Obligated as we are to tradition, you can insert and use these modules, as well as modules from other manufacturers such as Roland, Korg, Yamaha or CreativeLabs.

Naturally, a MIDI driver is available for the external wavetable – as always. The driver can be selected under the name "DMX 6fire WaveTable" and can be used with a full 16 MIDI channels. If you use a different front module such as the microWAVE PC, the MIDI information will be forwarded to the second MIDI interface.

Connecting a joystick.

Maybe you still remember: sound cards have always accommodated joysticks, steering wheels, and the like. Why this should necessarily be the case is a completely different question – after all, nobody expects to find a printer port on a graphics card, no matter how sophisticated it might be. Modern joysticks tend to use the faster USB port, which has the additional advantage of accommodating multiple input devices.

Having said that about tradition, we're choosy about the traditions to which we're obligated - and after all, somebody had to make the first step. We're certain that you'll see other manufacturers drop the joystick ports from their sound cards as well in the near future as a result. Viva la Innovación! ;-)

The software.

Your TerraTec Team spared virtually no expense and left no mountains unmoved to present you a truly stunning software package. It contains programs with which you can:

- set up and control the SoundSystem DMX 6fire 24/96,
- listen to all major (and a couple of minor) audio file formats,
- edit recorded and imported audio data,
- do professional-quality sequencing, and have fun in many other ways as well.

One could say it's complete. And the best thing about it: the programs are powerful enough to deliver professional results in all areas. Solid tools, no frills. Well, almost: if it's goodies you're looking for, you'll also find them on the SoundSystem DMX 6fire CD. We've filled the "HOTSTUFF" folder – a TerraTec tradition – with a collection of what we consider to be the choicest audio shareware and freeware programs. It'll keep you busy for hours, at work and at play.

But let's get back on track. After you've installed the software – and assuming you've selected all programs for installation – you'll find the following programs on your system, which we'll be covering in the following overview. For further information, please see the help files of the individual applications. Enjoy!

The drivers.

The SoundSystem DMX 6fire 24/96 features a range of drivers for a variety of applications. The drivers support all bit rates between 8 and 32 bits with all common sample rates between 8 and 96 kHz. As a rule, the sample rates are not "interpolated". In other words, the DMX 6fire 24/96 always automatically sets itself to the sample rate with which an application is recording or playing back. This prevents quality losses due to internal sample rate conversions. There are exceptions, however, which we will be covering below. And now to the individual drivers.

The DMX 6fire 24/96 wave driver.

In most Windows programs, you will encounter drivers with the designation "DMX 6fire Wave" for recording and playback. Signals output using these drivers will generally be available at the system's analog outputs; they also support the recording of analog signals (from line, microphone, tape or phono input, as well as the internal analog inputs).

The ASIO driver.

Programs that support Steinberg's ASIO (or ASIO 2.0) interface will display the ASIO driver of the SoundSystem DMX 6fire 24/96 in the relevant dialogs. With ASIO, programs achieve extremely short delays (latency) during audio recording and playback. With Cubase VST, for example, a latency averaging 7 to 20 ms should be achievable. On fast, cleanly set up systems, latency can be reduced to 1.5 ms at a sample rate of 96 kHz!

The MIDI driver.

A special driver is available for MIDI communications via the MIDI IN and OUT sockets of the front module. The driver designated as "DMX 6fire MIDI" in this system, and it can be selected in any situation in which its use would be appropriate. The SoundSystem DMX 6fire 24/96 provides you with a maximum of two (in conjunction with DXF or microWAVE PC) separate MIDI input and output drivers, giving you a total of 32 MIDI channels.

If MIDI files being played using the Windows Media Player are also to be forwarded to external devices, open the "Sounds and Multimedia Properties" dialog in the Windows Control Panel and set the MIDI output to the driver specified above (see also the "Installation" chapter, page 13).

In detail – special properties of the DMX driver.

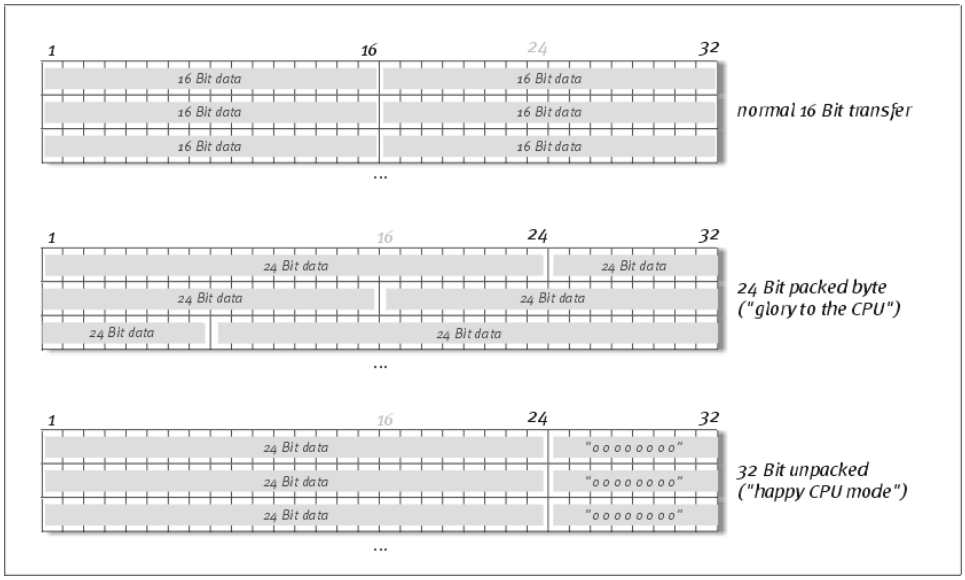
The following contains in-depth information for those with the need to know. Less experienced users won't encounter any problems if they skip over this section.

32-bit data transfer.

The driver support a special data transfer format known as "32-bit unpacked". Audio data streams are transferred to the computer's main memory via the PCI bus. The PCI bus features 32 "lines" (32-bit). A PC generally takes care to ensure that its data lines are well-utilized. For this reason, 8-bit audio data is always sent on its way in groups of four packets (4 x 8 = 32), and 16-bit data (2 x 16 = 32) in groups of two (top of diagram).

The situation is a bit more complicated from the processing standpoint with 24-bit audio data: suddenly there's "only" 24 sweet-sounding bits available, i.e. 8 bits are "missing". The "24-bit packed" process solves this problem in the following manner: the computer CPU (your Pentium, for example) divides the 24-bit data into multiples of 32 (middle of diagram). That costs computing power and isn't really necessary.

The "32-bit unpacked" process fills the remaining bits with zeroes and the driver sends suitable 32-bit packets on their merry way. Most commonly-used applications currently support this process, which is particularly easy on the computer's resources (bottom of diagram).



DirectSound & WDM.

It goes without saying that the drivers of the DMX 6fire 24/96 also support Microsoft's DirectSound or DirectSound 3D interface. What's more, the software complies strictly with Microsoft's WDM specification. WDM (Windows Driver Model) is a recent driver concept from that popular Redmond-based software manufacturer which also involves a number of innovations in the audio sector. For example, the drivers are able to play back audio data streams from multiple applications (MME and/or DirectSound) in parallel (multi-client, a "luxury" that faithful TerraTec customers have enjoyed since 1997).

WDM sample rate (SR) interpolation.

The multi-client capability of the WDM architecture also permits the simultaneous playback of multiple audio data streams with differing sample rates. The sampler rate used for all streams is based on the file with the highest sample rate. All further data streams are interpolated as required and their pitch is not affected.

An SR conversion/interpolation does always result in a certain loss of quality, however. You should therefore ensure that you do not use several programs simultaneously with differing sample rates for applications in which the highest possible audio quality is vital. For example, it's best to only have the playback software running when transferring a piece of music at 44.1 kHz to a DAT recorder. In the DMX ControlPanel you can also bypass possible level adjustments (= changes to the data stream!) by enabling the "Wave Playback" option on the Settings page. This setting is especially important if you want to transfer AC3 or DTS signals via the digital interface, for example to an external Dolby digital decoder.

WDM kernel streaming.

WDM kernel streaming also represents a new technology for Microsoft. Like established models such as Steinberg's ASIO interface, kernel streaming permits extremely fast access to the audio hardware. The deployed software (such as audio/MIDI sequencers or software synthesizers) must support the WDM function directly, however. At the time of printing, a program that we know and have tested is Cakewalk's new "Sonar™" recording software.

Please also read the "Sonar Tips" in the "Documents\Tips" folder of the CD.

The DMX ControlPanel.

The DMX ControlPanel is - next to the drivers – by far the most important piece of software in the package. Here you can configure your DMX 6fire 24/96 to suit any given situation, adjust sensitivities, reduce volume levels, and much more.

On the mixer side you can adjust sensitivities and levels, toggle the phono filtering and select a recording source. The right-hand side of the DMX ControlPanel always remains the same and controls the overall level of the system.

How does the ControlPanel work?

The DMX ControlPanel and the routing (signal flow within the card) of your DMX 6fire 24/96 is very easy to understand – despite the wealth of options. The DMX ControlPanel is organized in the form of several pages on which you can view or change the system's configuration: Mixer, Surround, Settings and the About dialog. Let's start with the:

Mixer page.

Let's have a closer look at the five channels. From top to bottom, you'll see the labels CD1/2, Line In, Phono/Mic In, Digital In and Wave Play – so far so good. The master area, which is identical on each page, is on the right. More about it later.

The three "analog" channels (CD, Line and Mic/Phono) feature round gain controls. The card has several preamplifiers to boost the levels of the input signals that can be adjusted with these controls. Experienced users will be pleased to hear that the boost (up to +18 dB) is realized professionally *before* the A/D conversion. This ensures that the high-quality A/D converters always deliver their best possible performance.

The gain stage also features a multicolored Clip LED. These give you a visual warning of excessive levels and impending distortion. A yellow light signals the –1 dB limit; red indicates that the 0 dB mark has been overdriven, possibly leading to audible distortion.

The colorful lights in the panel aren't just intended to brighten your day, they're primarily designed to help you set the signal levels cleanly. The display above shows the attenuation ranging from 0 to –45 dB. For pros: attenuation is applied in steps of 0.5 dB to -43.5 dB. The –45 dB setting activates a hardware-based gate function which is essentially the same as that of the mute switches (see below). This adjustment range (of "only" 45 dB) is certainly appropriate, as it a) ensures that the available mouse adjustment range is used in an optimal and linear manner and it b) guarantees truly practical regulation. If you would like to attenuate a signal further, you can do so in your software, an approach which is generally more appropriate.

Hover over one of the colorful VU meters briefly with the mouse cursor and the current peak signal level in dB will be displayed.

The mute switch silences the signal completely.

The stereo link function (enabled by default) permits the left and right signals to be adjusted simultaneously.

The VU displays can be disabled with a right-click to conserve system resources.

While the first channel (CD 1/2) is reserved for the control of the two internal CD connections, the remaining four can be assigned a source, with the exception of the WavePlay channel. These can be selected using the small pop-up menus, which can display the following sources:

Channel 2 Line In	Front	Applies the analog Line In/Tape input of the front module to the channel. This is indicated by the associated LED on the front module.
	Rear	Applies the analog Line input on the slot plat of the PCI card to the channel.
	Internal	Applies the onboard AUX input on the PC board to the channel.
	Wavetable	Applies a wavetable module, if present, to the channel.

Channel 3 Phono/Mic In	Phono	Applies the phono input on the front module to the channel and enables the special phono preamp.
	MIC	Applies the microphone input on the front module to the channel.

Channel 4 Digital In	Optical	Applies the optical digital input on the front module to the channel. This is indicated by the associated LED on the front module.
	Coaxial	Applies the coaxial digital input on the front module to the channel. This is indicated by the associated LED on the front module.
	Internal	Applies the onboard CD-ROM digital input on the PC board to the channel.

The first four channels control all of the input audio sources of the DMX 6fire 24/96; channel 5 controls all audio signals that are output using the WavePlay driver.

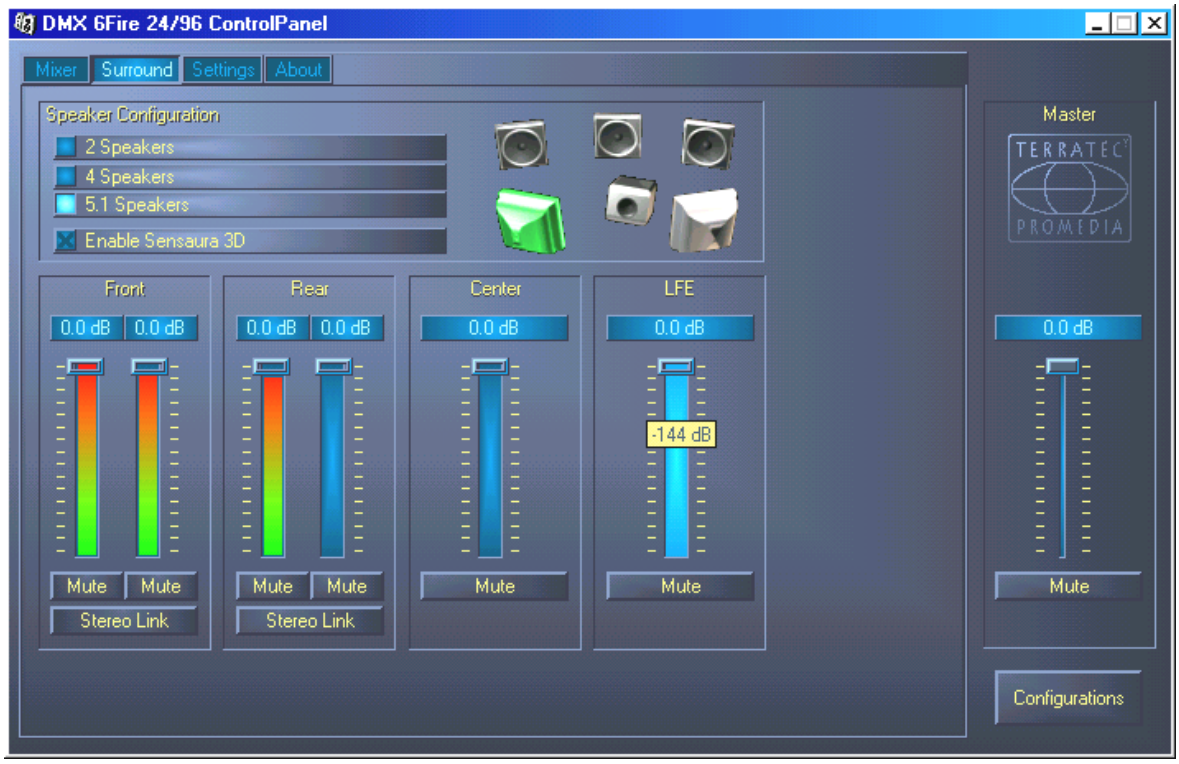
Record source enables one of the four input channels for recording. For example, select "Phono/Mic In" here and "Phono" for the appropriate channel to make a recording from a vinyl record.

The **RIAA button** enables the filtering required to play back or make a recording from a vinyl record. In commercially available hifi amplifiers, RIAA filtering is permanently activated. The SoundSystem DMX 6fire 24/96, on the other hand, has the option of disabling RIAA filtering. You thus have the option of applying custom filters (when restoring shellac recordings, for example) with special editing software that supports them.

So much for the first window. Now let's have a look at the multi-channel settings.

Surround page.

The Surround controls the volume of up to 6 audio channels for multi-channel playback, as used in DVD audio, for example.



The Surround configuration of the DMX 6fire 24/96 – here's where you control the relative levels of the surround channels.

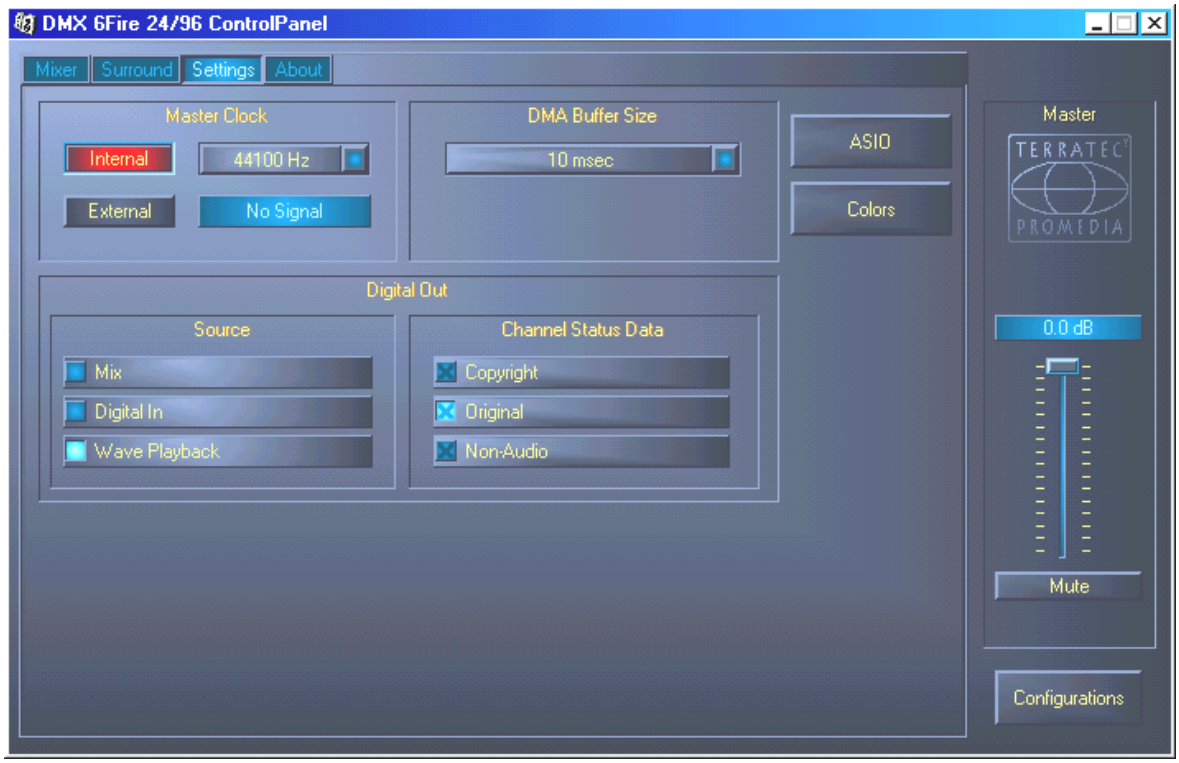
Use the top section – under **Speaker Configuration** – to select your speaker setup. These can be 2, 4 or 6 speakers. A right-click on a speaker symbol will mark it in color and will apply a test signal to that channel.

The **Enable Sensaura 3D** function applies an algorithm that permits a more spatial, three-dimensional sound to be achieved with only two speakers.

The **volume controls** control the relative levels of the channels. As the signals can only be attenuated, you must reduce the levels of the other channels to hear the center channel louder, for example. ––

Settings window.

Here's where we come to the real nuts and bolts. To be more precise, to a number of sophisticated technical details – which aren't very difficult to understand, however. Specifically, these are:



The Settings page for the configuration of drivers, digital interfaces/filters and the color settings of the ControlPanel.

The Master Clock.

Here we're dealing with the sample rate used by your SoundSystem DMX 6fire 24/96. This is – depending on the application - a very important point, as the card can be (and in some cases, must be) controlled by an external signal (from a MiniDisc recorder, for example), or it can specify a rate for itself internally and can share this signal via the digital interfaces with other devices being used for recording.

If a valid S/PDIF signal is being applied to a digital input, its sample rate will be displayed in the DMX ControlPanel, and the SoundSystem can and should be set to this external sample rate (**External**). If you forget this step, audible errors such as dropouts and clicks may occur during recording - and already when monitoring the signal.

Naturally, you should also pay attention to the settings of your periphery in the reverse situation (synchronizing an external device with the DMX 6fire 24/96). In that case, set the DMX ControlPanel to "Internal", as it also would be when you are not using external digital devices. If the devices are to be *permanently* connected to one another in both directions, you must decide which device will provide the clock signal.

The digital interfaces of the DMX 6fire 24/96 support all bit resolutions between 8 and 24 bits, as well as all sample rates between 8 and 96 kHz. Please note that not all devices can process sample rates higher than 48 kHz. For example, if you would like to transfer a signal recorded at 96 kHz to a MiniDisc player, you will need to convert the file(s) to 44.1 kHz or 48 kHz first. You can use the included WaveLab 2.0 Lite for this.

DMA Buffer Size (DMA Buffer Transfer Latency).

In some programs you will not only be confronted with the choice of an audio driver, but also with the selection of a so-called buffer size. The underlying functionality is also relevant for topics such as ASIO (this has its own dialog). WDM kernel streaming (see page 32) is also directly affected by this. Although it may appear somewhat complicated at first glance, it is extremely useful when you understand its significance – and it's not really that difficult after all.

The number and size of audio buffers determines the speed with which an application (such as a software synthesizer) can access the Windows driver. A smaller number of buffers and a smaller buffer size will ensure that the card responds faster. You will notice this when adjusting the controls of a software synthesizer, for example, or when moving the play marker during playback in a hard disk recording program.

You might think faster is better, but there's a catch. The setting is system-dependent and - if the system is too slow – an excessively low value will result in audible dropouts during recording and playback. If you notice dropouts, raise the value.

ASIO.

The ASIO button will take you to the settings for the so-called ASIO buffer size. These are responsible for the "speed" of the ASIO driver. A lower number of samples per buffer will reduce the time that elapses before an application issues audio signals with ASIO support. This setting is system-dependent. In the best case, the software will have a latency of around 1.5 ms. On average systems with processor loads typical for a music PC, you can expect values around 7-30 ms. Please note that you may have to restart the ASIO application before you can work with the new settings.

Digital Out.

The Settings page of the DMX ControlPanel lets you choose from a variety of sources for digital audio output. The following source settings are available in the "Digital Out" field:

At the click of the mouse: signal sources and S/PDIF filters.

Mix sends the complete signal of the ControlPanel – including all relative levels - to the S/PDIF output. In other words, the same signal will be available at the digital output as at the analog output (Front).

Digital In sends the signal applied to the **digital input** directly to the digital output without losses. Be sure that the synchronization is correct, however!

Wave Playback delivers the signal output of an **audio application** directly to the digital output. You will need this setting to send control information as used in AC3 and DTS signals in addition to the audio data. The audio signal is "bit-true".

In addition, the following parameters can be selected in all three positions:

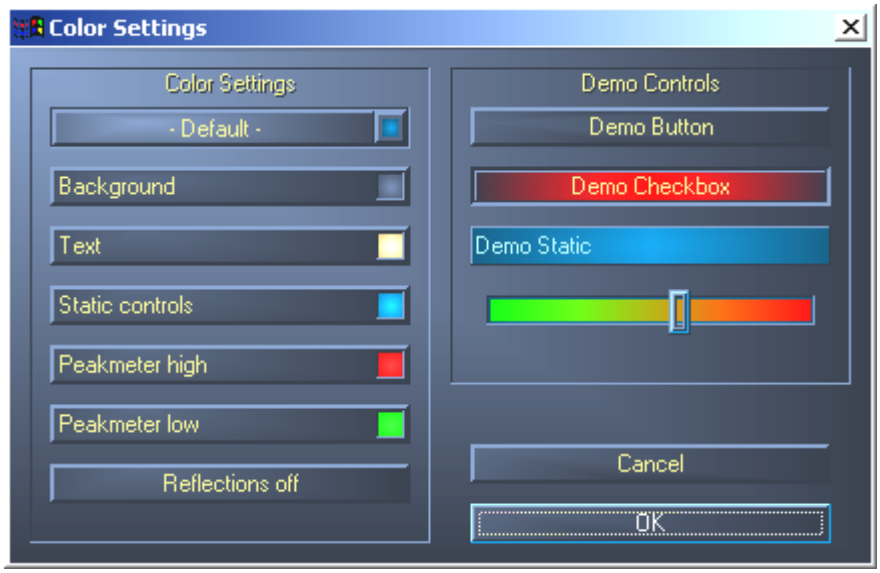
Copyright adds a copy-protection ID to the signal or filters it out when deactivating copy protection. This function sets the so-called "copy protection bit" which ensures that *no* digital copies can be made of the signal.

Original activates the so-called "generation bit", permitting exactly *one* digital copy to be made. Disabling this function sets the bit to 0 – you can then copy to your heart's content.

Non-Audio adds information to the data stream that indicates that control information (such as channel assignments) is being transferred in addition to the audio information. Activate the Non-Audio mode when transferring AC3 or DTS audio signals from a software DVD player to an external decoder.

Color.

Here you can configure perhaps the most vital system settings within the ControlPanel. No matter where you look, our days are filled with color. After all, life is beautiful, and there's nothing like pink buttons and delicate green reflections to breathe life and good cheer into your boring Windows desktop. Have fun...! ;-)



But seriously, folks – the "Reflections off" option toggles the attractive reflections of the elements. This can be helpful for slower systems.

What's more, you can use the pop-ups to choose from among a number of preconfigured designs. "Default" restores the original display settings.

By the way, users who hate colorful UIs or who are obsessed with performance don't need to worry: with the reflections disabled, the system load is no greater than when displaying "normal" (gray) Windows elements.

The About window.

...will display information on the audio drivers and system settings. These details can be useful when contacting TerraTec support.

The mixer icon appears in the Windows system tray (in the lower right corner, next to the clock) whenever the ControlPanel has been loaded. Right-clicking the icon offers direct access to a number of functions that are also available from the Panel itself – please see the sections above for further information.

Quit.

... or Alt+F4. Done. Finished. Basta. Outtahere. Thassall, folks.

Hide/Show minimizes or maximizes the ControlPanel.

WaveLab Lite 2.0

WaveLab, Steinberg's sample editor, has received many awards and is especially suitable for recording and editing large audio files. Even recordings in 24-bit/96 kHz format are no problem for the application. **It's now possible to make genuine 24-bit recordings on a WDM driver system thanks to the support of the DMX 6fire 24/96 WDM interface.**

Precise zoom functions and a wide range of tools for fast editing do an excellent job of rounding out the software side of your SoundSystem.

As WaveLab will probably be the program you'll use the most, here's a quick-start guide for your own first recording:

Start the program.

Open the "Options" menu, select "Preferences" and go to "Sound Card" on he settings page (you can also press CTRL+P).

Select a DMX 6fire playback and recording driver: “DMX 6fire Wave”.

Close the dialog with OK.

Press the red record button or the " * " key on your numeric keypad (asterisk or x at the top right, next to the minus key) to open the recording dialog.

Select a sample rate (this must correspond to the card's clock - see ControlPanel) and bit rate and start the recording.

The application will continue recording to the hard drive until you stop the recording or the system indicates that the drive is full.

Next, you can edit and save your new file.

For a detailed description of the application, please see the online documentation in the "Documents" folder of the product CD.

MusicMatch Jukebox.

Just as all beginning programmers have their first programs greet them the line "Hello World", all sound cards traditionally come with so-called media players in their software bundles. :-) The MusicMatch Jukebox is much more, however – and that's why it's included in the TerraTec package: in addition to playing a variety of audio file formats, the program supports simple, digital ripping of audio CDs. If desired, it writes the data to the hard drive in MP3 format, including title information, using the original Fraunhofer codec for the highest-quality MP3 results.

Cyberlink Power DVD 3.0 - 6-Channel

This application is a further highlight in the package. Together with your DVD drive, it plays DVD movies and directly addresses the 6 (5.1) analog outputs of your DMX 6fire 24/96. Pure surround-sound...

For a detailed description of the application, please see the online documentation.

Algorithmix Sound Laundry TerraTec Edition

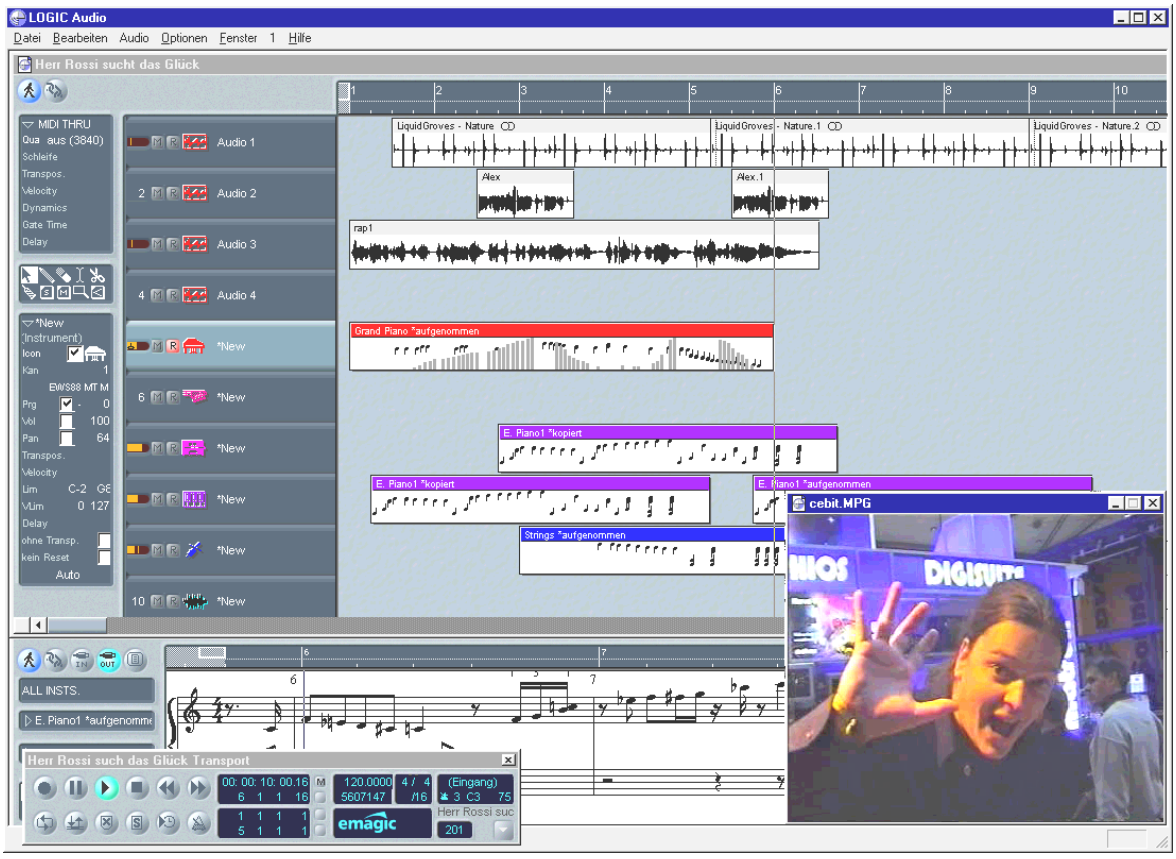
Sound Laundry™ ***TerraTec Edition*** is a powerful tool that lets you clean up problematic material such as older recordings, directly on your PC. It lets you remove or significantly reduce unwanted noise while maintaining the authentic sound and quality of the original recording.

For a detailed description of the application, please see the online documentation in the "Documents" folder of the product CD.

Emagic MicroLogic Fun.

With Emagic's Logic, we're proud to present one of the most successful - and in its current version, even more powerful - audio/MIDI sequencers as a part of our package. For the few of you that don't know this application which enjoys worldwide popularity: Logic supports the recording and convenient editing of MIDI and audio files. Among its many features, Logic offers you a musical notation view, a range of MIDI and audio editors, and the integration of videos for dubbing purposes.

Support for the DMX 6fire 24/96 ASIO drivers is new in this version, as well as the ability to create custom driver combinations for MicroLogic using the Logic Audio Device Setup Manager (this is particularly useful when using multiple DMX 6fire 24/96 or other TerraTec cards with EWS/EWX technology in a single computer).



Please note that MicroLogic Fun is currently only supported by Windows 98SE and Windows ME.

For a detailed description of the application, please see the online documentation.

The HOTSTUFF folder.

We've put together quite a collection of additional programs, tools and files on the SoundSystem DMX 6fire 24/96 CD-ROM. This folder is definitely worth a closer look.

Many of the programs in the folder are shareware. Please support the shareware principle and pay the authors for the programs you enjoy and use regularly. Thank you.

Practice.

Connecting and recording from a turntable.

A brief introduction for our younger readers: A "record" is a black, rotating vinyl disk. In the final years of the 20th century, records were used almost exclusively by so-called "DJs" in discotheques... ;-)

The archival or restoration of vinyl or shellac records is an extremely hip activity at the moment. With the SoundSystem DMX 6fire 24/96, you're well-equipped to make high-quality audio recordings. Well equipped? More like perfectly equipped! You can take any reasonably modern turntable with a moving-magnet pickup system and connect it directly to the SoundSystem – without going through your hifi system or using a separate amplifier. – The phono preamp required for clean reproduction is integrated in the DMX front module, while the system supports RIAA-compliant signal filtering. We've also included Algorithmix Sound Laundry TerraTec Edition in the DMX 6fire 24/96 package, a professional application for the restoration of "dusty" recordings, and editing long sound files is child's play with WaveLab 2.0 Lite.

Plug your turntable into the "Phono" RCA sockets of the front module. If your turntable has a ground wire, simply connect it to one of the retaining screws on the cover of your PC's case. Next, find your favorite record and you're ready to go. Meanwhile, let's have a closer look at the DMX 6fire ControlPanel:

On the mixer page, the third channel (Phono/Mic In) controls the phono channel. Select "Phono" from the pop-up menu. The colorful VU displays will now visualize your nostalgic audio experience, and you should be able to monitor the sound of your vinyl on the card's first stereo output (F/Front on the slot plate or Line Out of the module). If you've established a digital connection between the output of the DMX and your hifi system, set the source for the digital output to Mix on the Settings page of the DMX ControlPanel. **Don't worry: the signal will still sound a bit distorted – more about that later.**

The two round knobs control the system's phono preamp. To set the optimal level (which is advisable for a perfect recording), find a loud passage on the record and turn up the level until both Clip LEDs mainly show yellow – and only occasionally flash red. –

Let's now take care of the quality of the signal and activate the RIAA phono filter with a good, firm click. Your record should now sound as it usually does – or maybe even a bit better. –:-)

You can now make the recording itself with any suitable Windows program, for example the included WaveLab 2.0 Lite. This application can also be used to edit signals that have already been recorded. You can then use Sound Laundry TerraTec Edition, which is also included in the package, to easily remove noise such as clicks or hiss and monitor the results in real time.

AC hum. Another tip: in some cases you may hear AC hum. This is due to the turntable and PC having different ground connections. Your turntable should have a ground wire attached to it somewhere, which you can connect to the case of your PC. Simply clamp the wire with the cover of the case or one of the cover retaining screws. **Do not insert the ground wire into the fan of the PC power supply or into any other opening near the power supply! Thank you.**

How was that again?

The audio signal is stored on a record as a pattern in the record's groove. This pattern is picked up mechanically by the turntable's stylus, which converts the "audio data" pressed into the vinyl into a weak electrical signal. Differences between pickup systems: Moving Coil (MC) and Moving Magnet (MM or MD for magneto-dynamic).

In MM systems a permanent magnet is moved; in MC systems the coil follows the movement of the record's groove. The advantage of MC systems is their lower moving mass, but they have the disadvantage of an output signal which is lower than that of MM systems by a factor of 10, making it more difficult to achieve a good S/N ratio.

Both MM and MC systems are capable of outstanding musical reproduction, but in practice the first system is the more common one.

RIAA filtering.

Perhaps you've accidentally connected your turntable to the wrong input of your hi-fi amplifier at one time or another. You probably noticed that the signal was not only very quiet, but also distorted. The reason: as the deflection of the needle is limited to specific range, high frequencies (= low amplitude) are amplified and low frequencies (= high amplitude) are weakened on the record. The signal from the pickup must therefore be processed (filtered) before it can be used.

The Recording Industry Association of America (RIAA) has defined a standard for the changes to the frequency ranges to ensure that all records can be played using the same filtering.

Shielding.

Due to the relatively low output levels that even moving-magnet systems achieve (MM approx. 2-5 mV, MC approx. 0.1-0.4 mV), a certain amount of protection has to be provided against external sources of noise. For example, using an overly simple power supply design can result in unpleasant AC hum.

Unfortunately, the mounting number of electronic devices in an average household means an increasing amount of electromagnetic interference. While these waves are very weak, they can still interfere with the signal from the pickup, which is also very weak, as mentioned above. This problem can be dealt with by carefully shielding the amplifier, as is the case with the metal front module of the SoundSystem.

The ground wire of your turntable, if present, also fits in with this topic. This wire establishes an electrical connection between the turntable and the shielding to help prevent AC hum.

Recording...

It's important to set the level of the phono input signal correctly to make use of the full dynamic range of your sound card's input converter. Play the record of which you would like to make a recording and keep an eye on the level of the VU meter in the DMX 6fire 24/96 ControlPanel. Use the **GAIN** control to adjust the level so that the yellow LED flashes occasionally. If the red LED flashes, the signal will be clipped. The optimal level is just below the 0 dB limit. Unlike recordings that you may have made in the past with a tape deck, digital recordings must ***never*** exceed the maximum level. In the analog world this might have passed for a desirable "tape saturation" effect, but with digital recording technology it leads to clearly audible distortion which is virtually impossible to "repair".

The recording's finished: now what?

Now that you've made the recording with your sound card and a suitable program such as WaveLab Lite, you will probably want to edit them at the digital level. "**Sound Laundry TerraTec Edition**" is included in the software package of the sound card. It's a powerful tool for the restoration of old records, yet it's intuitive and easy to use. If you'd like to use a different application to edit your recording, it should include at least the following functions: de-clicking, de-cracking, and de-noising.

Some programs offer additional functions such as the broadening of the stereo image (this is rather restricted on vinyl records in comparison to CDs) and equalizers with which you can freshen up the sound quality or add a bit of punch. However, please remember that less is generally more, and that too much tinkering can destroy the authentic sound of the original recording.

If you've recorded the complete sides of an LP from beginning to end, you may want to cut the recordings up into individual tracks using WaveLab or Feurio(TM) which you can find in the HOTSTUFF folder of the CD. Finally, you can burn your recordings onto a CD with your CD mastering software.

The digital interfaces of the DMX 6fire 24/96.

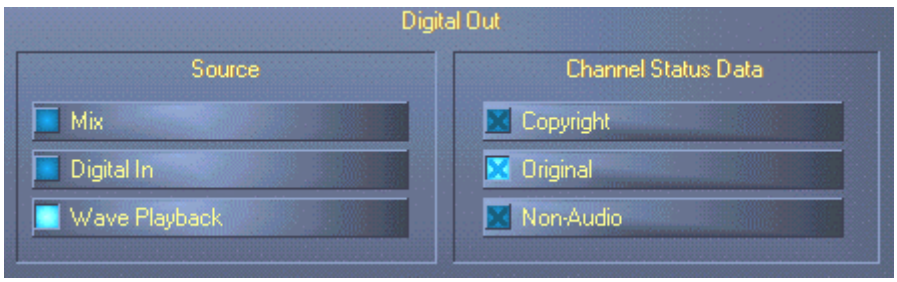
Devices that send or receive the S/PDIF protocol can be connected to the optical and coaxial digital interfaces of the DMX 6fire 24/96. These include DAT and MiniDisc recorders, for example. The interface supports the bit-true transfer of digital signals in all relevant resolutions. In addition, it supports raw data streams such as those used by Dolby's AC3.

Connections and ControlPanel settings.

Use the digital interface of your DMX 6fire to transfer music digitally from your computer to other devices, or to record audio data with your PC. One socket each is available to connect optical waveguides (optical fiber) or coaxial cables for recording and playback. As a rule, the devices to be connected will have one input and output socket (IN and OUT) each. Optical OUT sockets can be identified – in addition to the label - by the red light visible inside them. Simply connect the S/PDIF input of the DMX 6fire 24/96 with the S/PDIF output of the desired device - and vice versa, if required.

The initial level of a signal being sent to the card from an external device can be set in the ControlPanel using the "Digital In" control. Please note: this control has no effect on the signal strength (input sensitivity) of a recording. A digital level is always as it was originally recorded. To change the volume of such a recording, use a program such as WaveLab 2.0 Lite.

The Settings page of the DMX ControlPanel lets you choose from a variety of sources for digital audio output. The following source settings are available in the "Digital Out" field:



At the click of the mouse: signal sources and S/PDIF filters.

Mix issues the same signal via S/PDIF as is available at the **analog output (Front)**.

Wave Playback delivers the signal output of a **software application** directly to the digital output.

Digital In sends the signal applied to the **digital input** directly to the digital output.

In addition, the following parameters can be selected in all three positions:

Copyright adds a copy-protection ID to the signal or filters it out when deactivating copy protection. This function sets the so-called "copy protection bit" which ensures that *no* digital copies can be made of the signal.

Original activates the so-called "generation bit", permitting exactly *one* digital copy to be made. Disabling this function sets the bit to 0 – you can then copy to your heart's content.

Non-Audio adds information to the data stream that indicates that control information (such as channel assignments) is being transferred in addition to the audio information. Activate the Non-Audio mode when transferring AC3 or DTS audio signals from a software DVD player to an external decoder.

Always right on time – digital synchronization.

When recording via the S/PDIF interface, ensure that the so-called sample frequency (clock) of the card is synchronized with the source device. To guarantee the correct synchronization of the devices, set the **MasterClock** in the ControlPanel to "External".

If you forget this step, audible errors such as dropouts and clicks may occur during recording - and already when monitoring the signal. Naturally, you should also pay attention to the settings of your periphery in the reverse situation (synchronizing an external device with the DMX 6fire 24/96). In that case, set the ControlPanel to "Internal", as it also would be when you are not using external digital devices. If the devices are to be *permanently* connected to one another in both directions, you must decide which device will provide the clock signal.

The digital interfaces of the DMX 6fire 24/96 support all bit resolutions between 8 and 24 bits, as well as all sample rates between 8 and 96 kHz. Please note that not all devices can process sample rates higher than 48 kHz. For example, if you would like to transfer a signal recorded at 96 kHz to a MiniDisc player, you will need to convert the file(s) to 44.1 kHz or 48 kHz first. You can use the included WaveLab 2.0 Lite for this.

Dolby AC3 and DTS.

It is also possible to use the interfaces independently of the S/PDIF standard. Various manufacturers of software DVD players support the playback of DVD audio material via the DMX 6fire 24/96. Signals in Dolby AC3 or DTS format can therefore also be transferred using the digital interfaces.

Stuff worth knowing.

Digital cables.

Even when transmitting audio data via optical fibers, a few, usually inaudible, errors may occur. You should therefore be sure to use high-quality cables that are not too long: flexible plastic cables should have a maximum length of 1.5 m, the less-flexible glass fiber cables may be up to 5 m long.

Audio differences with digital cables seem improbable at first glance, but they can happen nevertheless. This is due to the fact that error correction algorithms are obviously used more frequently at some times than at others to compensate for quality differences between individual cables. However, these audio changes are usually so minimal that you need to be careful not to mix up the myth with the reality. If you're interested, there are a number of somewhat entertaining militant newsgroups dealing with this subject on the Internet ;-) .

AES/EBU.

Devices with AES/EBU interfaces cannot normally be used on S/PDIF interfaces - ambitious tinkering with simple adapter plugs will not get you anywhere. As 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 a bit of soldering.

Appendix.

FAQ – frequently asked questions and their answers.

A FAQ (Frequently Asked Questions) for initial problem-solving can be found on the installation CD and on the Internet at **www.terratec.net/ttus/support.htm**.