

AudioSystem



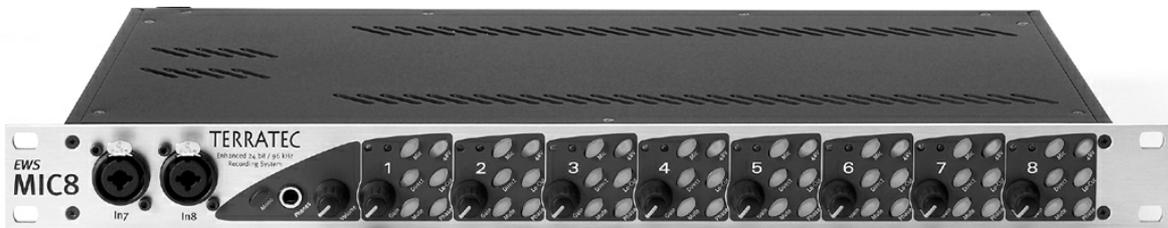
Enhanced 24 Bit /96 kHz Recording System

AudioSystem



Enhanced 24 Bit /96 kHz Recording System

English Manual



Version: 1/30/05

CE Declaration

We:

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

hereby declare that the products:

AudioSystem EWS MIC 2 and AudioSystem EWS MIC 8

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

1. EN 55022 Class B
2. EN 55024
3. EN 60065

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



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Safety note.

When connecting analog devices, ensure that the power is off to protect your hearing from sudden peaks. For digital devices, be sure to at least lower the volume on your playback equipment.

Welcome!

We're pleased that you have chosen a TerraTec AudioSystem and would like to congratulate you on this decision. You've purchased a sophisticated product representing the state of the art of studio 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 describes the **FireWire™** versions of the EWS MIC2 and MIC8 AudioSystems. It covers the correct use of the systems in complete detail, and provides practical tips so that you can get started as soon as possible. But first, here's a quick overview:

Connection versatility—with a system.

The EWS MIC2 and MIC8 19" modules feature a range of professional connector options that predestine them to become the audiophile hub of your home or project studio.

➤ For everything you need to know about audio connections, see page 16.

Choice preamps—made by SPL.

When it came to selecting microphone preamps, years of experience and our desire for the best possible audio quality made our choice an easy one: SPL. Important parts of the sophisticated analog circuitry were developed in cooperation with SPL's engineers for a sound as clear as glass—and which doesn't stop dead at the XLR connector, as is often the case.

Nerve center—the software.

As you know, a professional audio system is no sound card for wild-eyed gamers, but the heart of your day-to-day studio work with your PC. And despite its extensive routing options, the EWS software gives you a clear overview at all times and—depending on the complexity of your switching needs—stays transparent and intuitive.

➤ For everything you need to know about the EWS ControlPanel, see page 28.

Pure performance—the drivers.

The selection of drivers for the EWS MIC series leaves nothing to be desired. A highly developed software architecture guarantees problem-free use with all modern Windows and Apple operating systems.

The ASIO and GSIF (GigaStudio) drivers—thoroughly proven throughout years of studio application—allow the lowest possible latency between the (software-based) sound generation and output/inputs.

➤ For the details on driver use, please turn to page 21.

We hope you enjoy your work with the EWS MIC system and would like to suggest that you browse this hopefully entertaining manual when you get the chance. In addition to the important information about its technology, we have outlined a number of typical applications as well as tips and tricks wherever appropriate. We're convinced that even experienced users will profit from this guide.

Thanks for your attention—and here's to your creativity.

...your TerraTec Team

From opening the package to installation.

Safety note:

Please ensure that the power is off before setting up analog audio connections to protect your speakers—and your hearing—from sudden peaks. For digital devices, be sure to at least lower the volume on your playback equipment. Connecting the device to the FireWire™ port of your computer may also cause a noise—please turn down the volume of your playback system accordingly.

Before running cables to the EWS MIC FireWire™ audio system, take note of any special points pertaining to the configuration of your computer. Also refer to the manual of your computer and other studio peripheral devices for their settings.

If you follow the instructions, the installation should run without any problems. If you still have difficulties, please review carefully the relevant chapter in this manual.

Our service hotline team will be happy to help you if you have any other questions about the product. The phone numbers can be found in the Appendix of this documentation.

Scope of delivery.

Start by making sure that the contents of the package are complete.

The scope of delivery of the **EWS MIC2 FW** and **EWS MIC8 FW** AudioSystems includes at least the following:

- 19" MIC2 or MIC8 rack module
- splitter cable with MIDI and WordClock sockets
- 4 m IEEE 1394 cable (6-pin to 6-pin)
- IEEE 1394 FireWire™ adapter (4-pin/6-pin)
- WordClock T adapter
- WordClock terminator
- customer service card
- registration card with the serial number
- this manual
- Besonic Premium Account

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

Applications.

Stand-alone mode. The EWS MIC 2 FW and MIC 8 FW AudioSystems can be used stand-alone, i.e. without a connection to a computer:

For use as a simple but high-quality microphone preamp (in conjunction with a mixer, for example) simply connect your microphones to the inputs on the rear of the module. Enable phantom power if needed and connect the outputs of the MIC module to the LINE inputs of your mixer or tape deck. For a description of how to connect inputs, outputs or the integrated digital mixer, please see “Scenes and stand-alone mode”.

With studio devices or PCI cards (Mac or PC) with ADAT interfaces. The EWS MIC2 and MIC8 AudioSystems can also be used as pure AD/DA converters on any ADAT interface. These can be found (in some cases as optional extras) on devices such as

- digital mixers
- hardware multitrack recorders
- synthesizers and samplers
- computers with suitable PCI cards.

In this case, connect line devices or microphones to the inputs of the MIC module and transfer the signals to the recorder (EWS MIC2/8 ADAT optical OUT to ADAT-device-IN) using optical waveguides (not included). Ensure that the optical output of the MIC module is not set to S/PDIF (see page 16). You must also select the desired sampler rate (44.1 or 48kHz). A switch is also available for this function (see page 16).

Conversely, digital signals from an ADAT can also be converted and output as a high-quality analog signal. Connect the optical output of the ADAT (OUT, lit when a signal is present) to the appropriate input of the module. The sampler rate is determined by the ADAT player. No further settings are required; the format will be identified automatically.

Note:

The correct ADAT firmware must be loaded in order to use the ADAT functionality of the EWS MIC system. By default, the EWS MIC system comes with a 96kHz-capable operating system. This firmware does not support ADAT. For information on installing an operating system with ADAT support, please see “Updating the firmware (Windows)”.

With Macs & PCs with FireWire™ interfaces. The EWS MIC2 FW and MIC8 FW audio systems feature integrated IEEE1394 FireWire™ interface boards. The integrated FireWire™ system supports a wide range of routings that would not be possible in stand-alone use or in combination with ADAT interfaces from other manufacturers. Multiple EWS MIC 2/8 FW systems cannot be used on the same PC or Mac.

The setup—Short and simple for busy professionals

- The driver installation in Windows XP (and higher) follows the established defaults set by the operating system manufacturer. You can find the drivers on the accompanying CD-ROM or on the Internet at www.terratec.com/ in the SUPPORT area.

Notes for Windows users

- The drivers have not been certified by Microsoft. You will receive a warning to this effect in Windows, **which you can safely ignore. You can continue the installation without concern.** If you are prompted to connect to Windows Internet Update (XP SP2 or higher), continue the installation without updating.
- After installing the drivers, open the “Device Manager” and check for yellow exclamation marks.
- The EWS MIC 2/8 FW Control Panel is automatically installed together with the drivers. The functionality of the audio system is restricted when using the standard Windows Mixer. The EWS MIC 2/8 FW Control Panel provides access to the audio system's full range of functions.
- The WDM audio drivers can be selected in the applications as usual. ASIO and GSIF (GigaStudio) 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 buffer sizes are configured in the EWS MIC 2/8 FW Control Panel.
- The device driver of the EWS MIC 2/8 FW FireWire™ system now features full multi-client support. For more information on this topic, see page 25.
- Multiple systems cannot be cascaded at present.

Notes for Macintosh users

- The EWS MIC 2/8 FW system is shipped with driver support for Apple Mac OS 10 (OS X). OS X version 10.3.6 or higher is required when using the audio system.
- The audio and MIDI connection using OS 10(X) is built exclusively on the OS10 core audio/MIDI concept.
- Multiple cards cannot be cascaded at present.

Windows installation—step by step

Please perform the following steps in the stated order. Do not connect the EWS MIC 2/8 FW module to the computer until instructed to do so.

Which operating system?

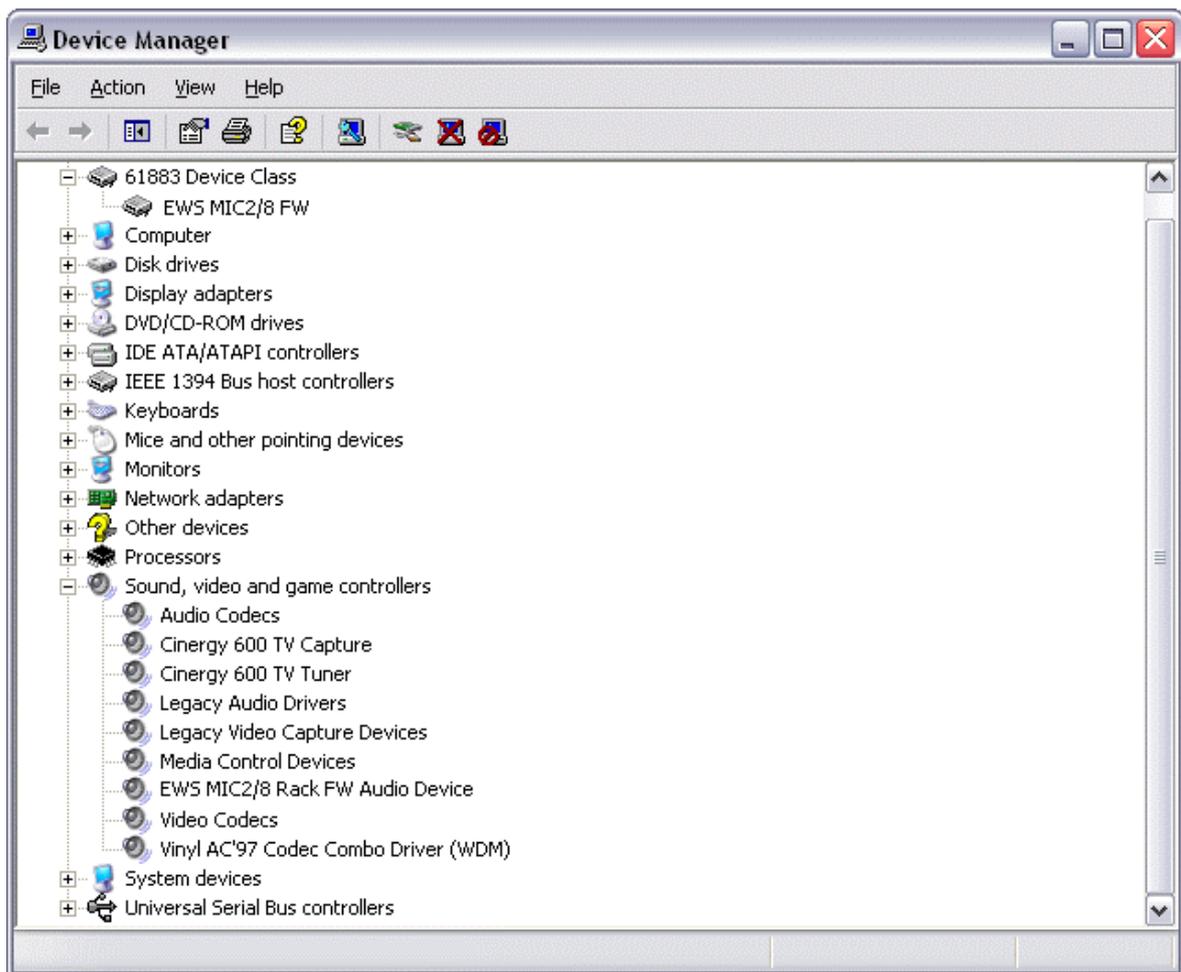
The EWS MIC 2/8 FW can be used only under Windows XP (Home and Professional editions). Older Windows versions are not supported. Please ensure that you have applied the current service packs and updates to your Windows installation (Service Pack 1 or higher).

Installing the EWS MIC 2/8 FW driver in Windows XP

1. Before you start, ensure that your Windows XP version is up to date. Right-click the “My Computer” icon and choose “Properties” from the context menu. Service Pack 1 (SP1) or higher must be installed on your computer. If it is not, please contact Microsoft (www.microsoft.com) to obtain an update for your system. The service pack is generally free of charge.
2. Ensure that the EWS MIC 2/8 FW system is connected to an AC power outlet, but do not connect it to the FireWire™ port on your computer at this point. Insert the included product CD and wait for the autorun application to launch. If the autorun application on the CD does not launch automatically, start the application manually by double-clicking “**Autorun.exe**” in the root folder of the CD. Click the “EWS MIC 2/8 FW Installation” button in the autorun application to install the EWS MIC 2/8 FW driver and Control Panel in your operating system.
3. Follow the instructions of the installation program for the remainder of the installation process. You can disregard the following safety warning without concern. Click “Continue Anyway” to continue.



4. Windows XP will now automatically recognize the device as new hardware and will open the driver installation dialog. If you have not yet set up a FireWire™ connection to your EWS MIC 2/8 FW module, the setup program will prompt you to do so now.
5. The Windows “Found New Hardware Wizard” will prompt you for a driver for the “EWS MIC 2/8 FW” hardware component. Next, select “Install the software automatically [Recommended]” and confirm with “Next”.
6. If your Windows XP system has been configured to do so, it will now set a system restore point. There's no need to worry—this is a routine precaution.
7. Part 1 of the installation is now complete. Therefore click “Finish”.
8. The Found New Hardware Wizard will reappear at this point. Select “Install the software automatically” to install the actual EWS MIC 2/8 FW drivers. Subsequent installations will prompt for the device driver only; the installation of the first part (4-7) will be skipped (explanation for the curious by nature: the EWS MIC 2/8 FW protocol driver under “61883 device class” is already known to the system).
9. You may once again ignore the dialog box that will reappear to inform you that the software that you are installing has not passed the Windows logo test.
10. Click “Finish” to complete the driver installation.
11. Once the driver installation is complete, the EWS MIC 2/8 FW audio system should appear as the entry in the Device Manager shown below. The “Device Manager” can be found on the Control Panel under “System” > “Hardware”. Then click the “Device Manager” button.



The Windows XP Device Manager after successful installation

The EWS MIC 2/8 FW as a system audio device (Windows)

If you would like to use the EWS MIC 2/8 FW not only for specific audio applications, but as your default Windows audio device, select the EWS MIC 2/8 FW audio driver in the Control Panel under “Sounds and Audio Devices” > “Audio” as the default device for the desired functions.

As the EWS MIC 2/8 FW is a professional audio interface, the input levels can be adjusted using the gain controls on its front panel. Setting the levels directly on the hardware ensures that the best possible dynamic range will be available from the high-quality converters.

Updating the firmware (Windows)

Thanks to software technology, updates to existing standards and new functions can be added to the EWS MIC 2/8 FW system without changes to the hardware by updating its so-called “firmware”. To update the firmware, proceed as follows:

- Run the program “TT_FW_WinFlash_Vx.x0.exe”. It can be found on the driver CD in the <CD>:\EWS MIC2_8\FireWire Version\Firmware\PC\ folder and can be downloaded from the Internet.
- Click “Open” and specify the firmware file you would like to load.
- Next, click “Upgrade firmware” to start the update process.
- Answer “Yes” to the safety prompt that appears now.
- The EWS MIC 2/8 FW must be restarted after the firmware update completes successfully. Disconnect the EWS MIC 2/8 FW from the computer and reconnect it, then restart the computer.
- In the event of a power failure during the update, or if the update does not complete successfully for any other reason, simply repeat the update. It's not possible to damage anything in the process.

Mac installation—step by step

Which operating system?

The EWS MIC 2/8 FW can only be used with Mac OS 10.3.6 (OS X) or higher. It can be integrated easily using OS X CoreAudio and CoreMIDI.

Installing the EWS MIC 2/8 FW driver in OS X

As mentioned above, the EWS MIC 2/8 FW uses the operating system's CoreAudio and CoreMIDI drivers. It's therefore not necessary to install a device-specific driver. Simply plug the device into your FireWire™ port and it's available immediately. To take advantage of the system's advanced functions, however, you must install the EWS MIC 2/8 FW Control Panel. These advanced functions include access to the hardware mixer or the switching of external clock sources. The setup file to install the Control Panel is located on the product CD in <CD>:\EWS MIC2_8\FireWire Version\Driver & Control Panel\Mac\EWSMicFW_Vx.xx.pkg.

The EWS MIC 2/8 FW as a system audio device (Mac OS X)

If you would like to use the EWS MIC 2/8 FW system not only for specific audio applications, but as your default Mac OS X audio device, select the EWS MIC 2/8 FW audio driver in the “Sound” control panel as the default device for audio output.

Updating the firmware (Mac OS X)

A separate application is available for Mac OS X to update or install ADAT or non-ADAT firmware. To update the firmware, proceed as follows:

- Copy “FWUpdater.app” to a convenient location such as your desktop and execute it. This application can be found on the driver CD in the <CD>:\EWS MIC2_8\FireWire Version\Firmware\Mac\ folder and can be downloaded from the Internet.
- Click “Open” and specify the firmware file you would like to load.
- Next, click “Upgrade firmware” to start the update process.
- Answer “Yes” to the safety prompt that appears now.
- The EWS MIC 2/8 FW must be restarted after the firmware update completes successfully. Disconnect the EWS MIC 2/8 FW from the computer and reconnect it, then restart the computer.
- In the event of a power failure during the update, or if the update does not complete successfully for any other reason, simply repeat the update. It's not possible to damage anything in the process.

The FireWire™ connection

FireWire™ is a serial PC interface similar to USB that was developed by Apple in 1995, and which was originally intended for digital video data and for external mass storage and audio devices. It has since been given many names that all refer to the same port: for example, Sony calls FireWire™ “i.LINK™”, Texas Instruments refers to it as “Lynx™”, and one also frequently sees the mysterious abbreviation “1394”. The latter designation actually refers to the common IEEE 1394 standard, which is notable for its high data rates (IEEE 1394a = 400 Mbps and IEEE 1394b = 800, 1600 and 3200 Mbps). (For those of you who are sticklers for detail, IEEE stands for the US “Institute of Electrical and Electronic Engineers”).

Like USB, FireWire™ also supports hot plugging—in other words, you do not need to shut down your computer to add or remove devices. However, you should take care not to interrupt any applications that may be accessing the EWS MIC 2/8 FW to prevent possible data losses or blue screens. Also please note that it may take the operating system a while to process the new situation—after all, machines are only man-made ;o).

One standard—two sockets

The socket on your PC can have two different forms, with either 4 or 6 conductors. According to the standard, in the 6-pin version the two extra pins are used to supply 7.5 – 30V / 1.5A per port. Unfortunately, this is often not the case due to the poor quality of some controllers that are unable to provide a constant operating voltage—despite the requirements of the specification. As a reliable power supply is very important for professional audio systems like the EWS MIC 2/8 FW, we decided in favor of a self-sufficient power supply and gave the device its own power adapter.

Two sockets—continued

Unlike USB, FireWire™ is a bus system. In other words, every FireWire™ device has a full-featured port for further equipment, so that individual devices can also be connected in series.

OK, it's currently only possible to link 64 devices in practice, but who has that many peripherals? Hubs—like those used by USB devices—are therefore superfluous as long as the cable length between the individual devices does not exceed 4.5 meters or a total of 72 meters, as this would cause problems due to signal attenuation. The connected devices will still work with one of the intermediate devices is switched off—the rest will still communicate via the ports. Please ensure that you don't create a loop—at some point you must have a final device without a further connection.

The EWS MIC 2/8 FW also has two connections for this reason. Which of the two ports you use to connect it to your computer is up to you—the sockets are identical.

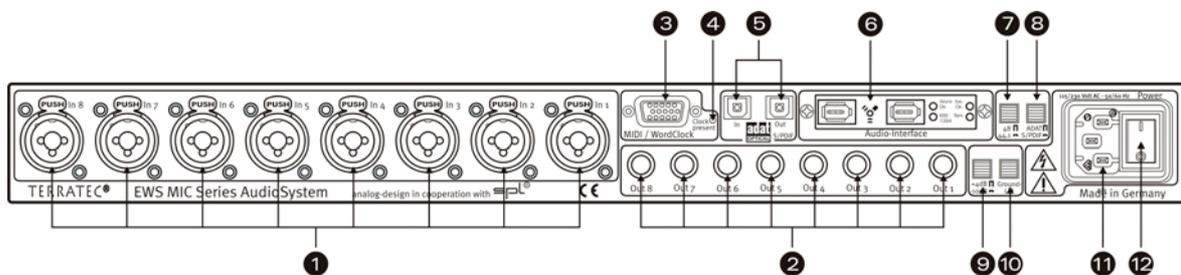
Be careful nevertheless, there are a number of potential stumbling blocks. The values listed above are theoretical. Most camcorders, for example, do not comply with IEEE 1394 and transmit their data without consideration of standards or potential losses. You

should also consider that a complex audio production may use the full bus width (400 Mbps in theory, but it may be considerably lower in practice). Should you have problems with additional FireWire™ devices connected to the EWS MIC 2/8 FW, please connect them to a different controller port.

The EWS 19" module.

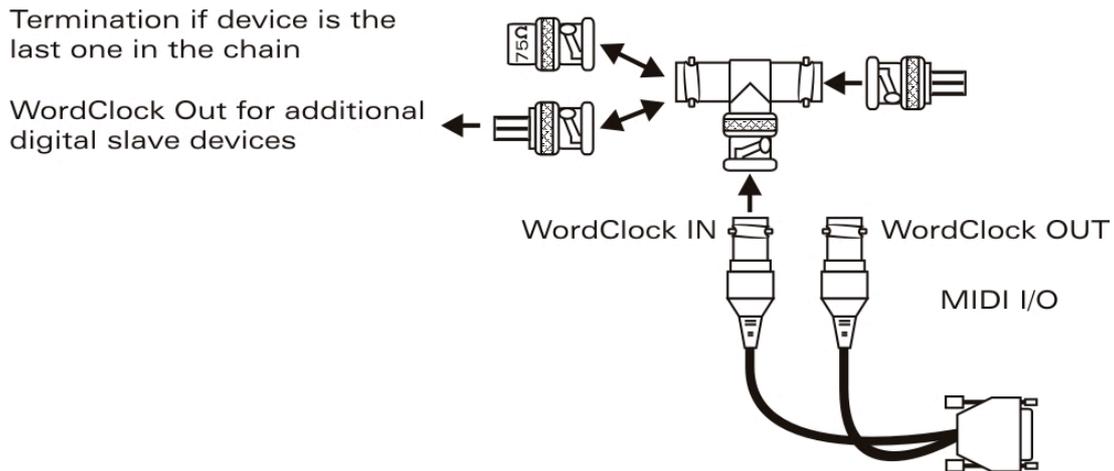
A full range of connections in only one 19" rack height unit (1U)—that's the heart of the EWS MIC system. On the following pages we will be covering the purpose of the individual connectors and controls in detail.

The rear panel.



A full range of connections in only one 19" rack height unit.

- 1) **Analog inputs.** Eight balanced inputs can be used with XLR or jack connectors. If the channel features a switchable microphone input (channel 1-8 for MIC8 or 7+8 for MIC2), the XLR socket will always be intended for use with microphones. In this case the jack sockets are permanently assigned to the line/instrument inputs (block diagrams in Appendix). The sockets on the front panel of the module can be used as an alternative to the inputs 7 and 8. This disables the signal path of the rear sockets.
Tip: it is not necessary to remove cables plugged into connectors 7 and 8 on the rear panel when using the sockets on the front panel.
- 2) **Analog outputs.** The eight balanced outputs are suitable for jack connectors. Activating the direct routing on the front panel will send any input signals directly to the appropriate output (see below).
- 3) **MIDI / WordClock interface.** Connect the included adapter cable with two MIDI inputs (IN) and outputs (OUT) here. Two BNC sockets are also available here for WordClock input and output.



- 4) **WordClock LED.** If an input signal is present at the WordClock input, the LED will light up. It does not matter in this case whether the clock signal is valid. The LED therefore is not a status indicator (in the sense of “synchronization OK”).
- 5) **ADAT & S/PDIF.** Both interfaces (IN and OUT) can be equipped with optical waveguides (not included) as needed. Devices can also be combined—for example ADAT and DAT recorders. A signal conversion, if needed, can be selected in the EWS Control Panel software (if the module is connected to a computer). All of the settings made in the Control Panel will also apply to stand-alone mode. When cabling digital equipment, always verify the synchronization (master/slave).

In stand-alone operation, incoming ADAT signals (IN) are converted digital-analog (D/A) and can be picked up at the analog outputs of the module—depending on their channel assignment (1 to 8). An exception to this is when routing the EWS MIC 2/8 FW digital mixer to a stereo output. This routing has priority and suppresses the ADAT channels assigned to this stereo output.

Conversely, all analog input signals are present at the ADAT-OUT when the unit is in stand-alone mode. Gain controllers, phase setting and filters are upstream to ensure an optimal signal prior to the analog-digital conversion.

If you are using your EWS MIC module with a computer, please note the wide range of routing options which are described in detail in the chapter covering the EWS Control Panel starting on page 28.

- 6) **IEEE 1394a FireWire™ ports (6-pin) and status LEDs.** The included FireWire™ cable (6-pin / 6-pin) connects the unit to the computer. With a length of 4 meters, the cable is long enough to cover greater distances. And just in case, we've included a 6-pin/4-pin adapter.

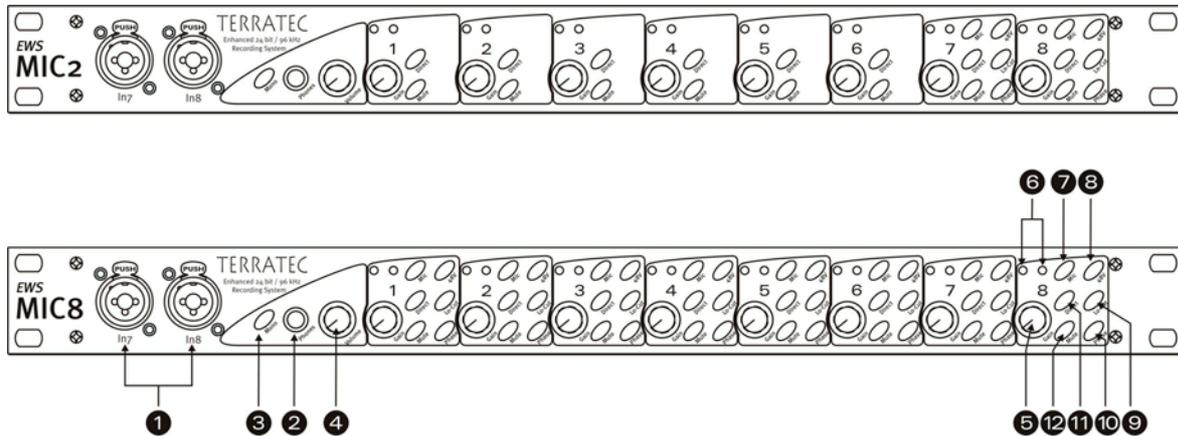
The meaning of the LEDs on the rear panel:

- ***LED IEEE1394: FireWire™ (IEEE 1394) communication is active***
 - ***LED Word-Clk.: WordClock is preselected external clock source***
 - ***LED: Ext.-Clk: Synchronization to external clock source successful (WordClock, ADAT or S/PDIF)***
 - ***LED Sync: Hardware running, valid clock signal (internal or external) available***
-

- 7) **Switch: Digital clock 44.1 or 48kHz.** If you are using a stand-alone EWS MIC module, i.e. without a computer (as a microphone preamp or ADAT converter, for example) use this switch to set the sampler rate.
- 8) **Switch: ADAT or S/PDIF.** This switch refers to the signal format to be present at the optical output when in stand-alone mode. When set to S/PDIF, both channels (7 and 8) are converted and output digitally (in other words: the eight channels are not mixed). **The ADAT firmware must be loaded for this purpose**, otherwise S/PDIF will be the only available format.
- 9) **Switch: +4 / -10 dB.** Globally adjusts the level of the analog outputs to your existing studio equipment.
- 10) **Switch: Ground Lift.** Activate “Ground Lift”, to separate the signal ground from the unit ground. This can be used to avoid undesirable hum pickup. It is better to eliminate the source of the hum, however, as activating the ground lift can reduce the signal-to-noise ratio.
- 11) **AC power.** Connect the included AC power cable. Please note: external power is required even if the device is connected to a computer (PCI card), as the device is not supplied with power via the data cable in the same way as some USB devices or the AudioSystem EWS88 MT. The integrated power unit automatically detects the power applied (110 volt/60 Hz or 230 volt/50 Hz).
- 12) **AC power switch.** Turns the power on and off. ;-)

The front panel.

As the name suggests, the only difference between the EWS MIC2 and MIC8 modules is the number of available microphone channels. On the EWS MIC2 module, only channels 7 and 8 are available for microphone signals. As a result, there are fewer buttons on the front panel for channels 1 to 6.



Three sockets, nine pots and 25 (48) switches for greater convenience in the studio.

- 1) **Inputs 7 and 8.** As an alternative to the inputs 7 and 8 on the back, these can be used for two sources that you may want to change from time to time. Inserting a jack or XLR plug into either of the sockets disables its counterpart on the rear panel.
- 2) **Headphone output.** Connect stereo headphones here. You will hear the mixed signal of all (!) channels input to the device including audio signals being output by the computer. By the way: thanks to the choice components used, the headphone amp will satisfy professional demands and should be used—if possible—in preference to monitoring via a mixer or even an ADAT recorder.
- 3) **Mono switch.** Do you need to quickly check the microphone phase position or the sound of the mono mix? Just press the button and find out how nice it is to have two ears.
- 4) **Headphone volume.** Even this can be adjusted as needed.
- 5) **GAIN pots.** Here you can set the gain of the analog inputs over a range of 20 dB, or 60 dB with the microphone preamp activated, BEFORE the A/D conversion.
- 6) **Signal and clip LEDs.** If an input signal is present, the signal LED for that channel will light up blue. At around -1 dB (the “0 dB mark” is at a solid +20 dBu or +60 dBu), the red LED lights to warn of impending distortion.
- 7) **Line/Mic switch.** Here you can set whether a signal with line level (e.g. synthesizers, effects) or a microphone signal is being applied to the input.
- 8) **Phantom power.** If your microphone needs its own 48 V power supply, it can be activated per channel as required.

-
- 9) **Subsonic filter.** Unpleasant impact sounds and associated signal peaks—such as those caused by an over-athletic singer—can be filtered out for the most part prior to the conversion. Just press the button and enjoy.
 - 10) **Phase switch.** Reverse the phase position of a microphone signal with this switch. This can be helpful to prevent signals from canceling one another out (interference).
 - 11) **Direct.** Activate this switch to transfer an audio signal applied to the analog inputs directly to the corresponding output. This function is useful in a number of different respects:

In stand-alone mode, you can use the 19" module as a simple microphone mixer and preamp (in conjunction with the mute buttons). If you already have a small mixer that you are using for live recording, we recommend trying the preamp of the MIC2/8 module instead—the SPL sound will convince you.

When recording with the PC, use the direct mode to monitor input signals directly, without a trace of latency. This is also possible using the ASIO 2.0 interface. Sometimes quickly pressing a hardware button is simply faster and more intuitive than three mouse clicks, however.

Sometimes the Direct button is useful simply to check whether an analog signal is actually present at the MIC module and hasn't gone astray in the depths of the computer.

- 12) **Mute button.** As seen on your mixer, TV remote and clock radio.

The Windows drivers.

The EWS MIC 2/8 FW audio interface features a range of drivers for a variety of applications. The audio drivers support all bit rates between 8 and 32 bits with all common sample rates between 32 and 96 kHz.

The WDM audio driver.

In most Windows programs, you will encounter a driver with the designation “*EWS MIC FW(x) Multichannel Out*” for **playback**. This driver supports 10 outputs (8 analog and 2 digital), or 16 outputs in ADAT mode (8 analog and 8 ADAT) and complies strictly with Microsoft's specifications for the WDM audio driver model. The playback software must provide suitable support to ensure that the individual channels are addressed explicitly. Low-latency driver models (ASIO, GSIF and WDM kernel streaming) permit separate addressing of all waveplay channels at all times. As the Windows WDM audio driver model does not support multichannel operation for **recording**, a separate recording device is available for each input pair (*EWS MIC FW (x) In 1/2, In 3/4, In 5/6, In 7/8, Digital 1/2, etc.*).

Windows default device for playback

A number of programs only access the selected Windows default device for audio playback (Start->Control Panel->Sounds and Audio Devices Properties->Audio->Sound Playback). In this case, playback is only possible via the waveplay channel 1/2 assigned to the analog output 1/2. The waveplay 1/2 signal can nevertheless be routed to any other analog or digital output using the hardware mixer of the EWS MIC 2/8 FW (for more information, see ➡ page 28).

Surround playback—*analog and digital (AC3/DTS)*

To play back **digital** AC3 or DTS streams (from a software DVD player, for example), activate the appropriate player (e.g. WinDVD or PowerDVD). The digital output can be activated separately here, as digital control information must be transferred in addition to the audio data. **Analog** playback—in 5.1 or 7.1 format, for example—is also possible using a software DVD player. For WinDVD 6, for example, activate the “*EWS MIC FW(x) Multichannel Out*” output driver as your Windows default audio playback device and select a 5.1 or 7.1 audio setup under “Advanced Audio Properties”. Then you will be able to activate your desired speaker configuration under WinDVD.

DirectSound and MME

It goes without saying that the WDM audio driver of the EWS MIC system also supports Microsoft's DirectSound or DirectSound 3D interface. Audio programs based on the older MME architecture are also accepted by the WDM audio driver and are routed via the Windows kernel mixer. A sample rate conversion (SRC) can thus also be applied to this format if required.

WDM sample rate 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 frequency used for all streams is based on the file called up first. All further data streams—those called up during the run time of the first file—are interpolated as required and their pitch is not affected.

Note: Unlike PCI cards, the EWS MIC 2/8 FW system cannot automatically synchronize the required sample rate. Select the sample rate manually using the dropdown menu in the Control Panel, especially if a SRC should be avoided.

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.

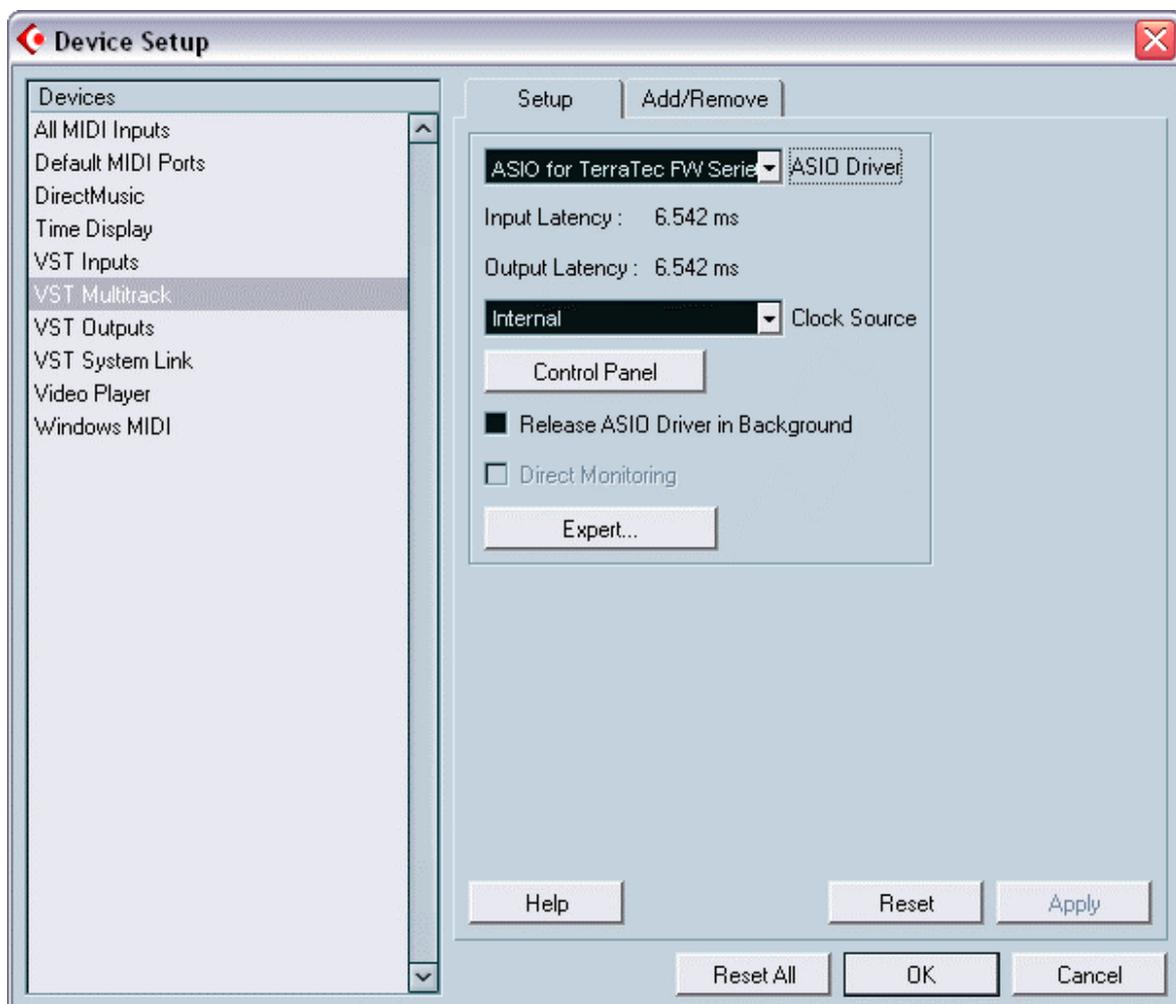
WDM kernel streaming

WDM kernel streaming also represents a new technology for Microsoft. Like established models such as Steinberg's ASIO interface, kernel streaming is designed to provide extremely fast access to audio hardware, more or less bypassing the mixer for direct hardware access. Thus the name “kernel streaming”—the kernel of the Microsoft Windows operating system permits the audio data to stream directly through. This extension of the WDM format was designed after a proposal by Cakewalk and is now officially recognized by Microsoft. The deployed software (such as audio/MIDI sequencers or software synthesizers) must support the WDM function directly, however. One of these programs, for example, is the “Sonar” recording software produced by the Cakewalk company.

The ASIO driver

The abbreviation ASIO stands for “Audio Streaming Input Output” and refers to a 32-bit driver model developed by Steinberg. The advantage of the ASIO driver is the extremely low audio recording and playback delay times, also known as latency. Values significantly under 10ms—and less than 4 ms on fast, cleanly-configured systems—at high sample rates are quite realistic. The format also supports sound cards with multiple inputs and outputs—so-called multi-I/O cards—as well as direct monitoring and multi-client mode (ASIO 2.0 or later).

Programs that make use of Steinberg's ASIO interface indicate in the corresponding dialogs the ASIO drivers of the EWS MIC 2/8 FW. The ASIO driver is listed in compatible programs under “ASIO for TerraTec FW Series”.



Device configuration in Cubase SX 2

The inputs and outputs (generally called “busses” or “channels”) available in the individual programs are generally called (in applications such as Cubase SX):

Analog input 1:	Line_1/2 left MIC FW	Analog output 1:	Multi-channel 1 MIC FW
Analog input 2:	Line_1/2 MIC FW	Analog output 2:	Multi-channel 2 MIC FW
Analog input 3:	Line_3/4 left MIC FW	Analog output 3:	Multi-channel 3 MIC FW
Analog input 4:	Line_3/4 MIC FW	Analog output 4:	Multi-channel 4 MIC FW
Analog input 5:	Line_5/6 left MIC FW	Analog output 5:	Multi-channel 5 MIC FW
Analog input 6:	Line_5/6 MIC FW	Analog output 6:	Multi-channel 6 MIC FW
Analog input 7:	Line_7/8 left MIC FW	Analog output 7:	Multi-channel 7 MIC FW
Analog input 8:	Line_7/8 MIC FW	Analog output 8:	Multi-channel 8 MIC FW
Digital input left:	SPDIF left MIC FW	Digital output left:	SPDIF/AC3 left MIC FW
Digital input right:	SPDIF right MIC FW	Digital output right:	SPDIF/AC3 right MIC FW

The Gigastudio (GSIF) driver

Tascam's Gigastudio software sampler features its own GSIF low-latency driver interface which has properties similar to Steinberg's ASIO. Please note that Gigastudio places relatively high demands on the PC and its performance, especially when using one or more ASIO applications at the same time (see "Multi-client applications"). In addition, Gigastudio features a Re-Wire™ connection. If a Re-Wire™-capable synthesizer such as Cubase SX connects to Gigastudio via this interface (this can take place automatically), operation via the GSIF interface becomes pointless and is thus blocked. The special GSIF driver of the EWS MIC 2/8 FW is not automatically installed together with the main drivers of the system; instead, it comes with a separate installation program. The installation can be started easily via the autostarter that opens automatically when you insert the product CD. If the autorun application on the CD does not launch automatically, start the application manually by double-clicking "**Autorun.exe**" in the root folder of the CD. The "GSIF Installation" button in the autostarter installs Gigastudio support in your operating system.

Tip: Do not install the GSIF driver unless you are actually using Gigastudio.

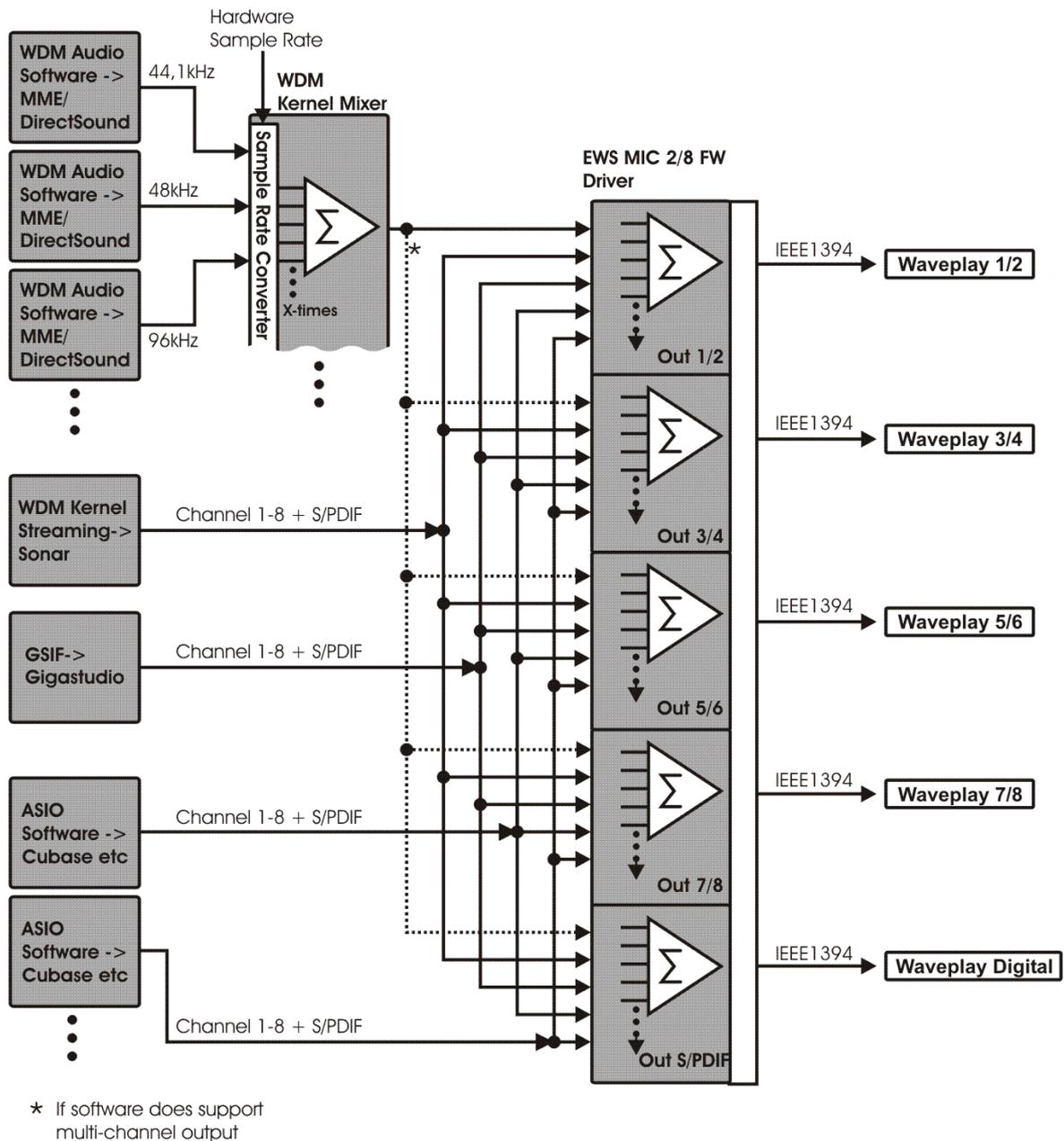
Multi-client applications

ASIO, GSIF and standard WDM (MME/DirectSound) software applications can always access ALL hardware inputs and outputs SIMULTANEOUSLY.

For example, if an ASIO sequencer and an audio editor such as Adobe Audition (formerly Cool-Edit) simultaneously access the same output (e.g. Out 1/2) of the hardware, the EWS MIC 2/8 FW driver will mix all sources before signal is sent to the output.

Tip: To prevent system sounds from accidentally occurring in your playback mix, ensure that the EWS MIC 2/8 FW is not selected as the default playback device for Windows. Alternatively, you may want to disable the system sounds altogether.

When accessing the inputs and outputs of the EWS MIC 2/8 FW with multiple ASIO applications and possibly Gigastudio, please ensure that all applications are set to the same sample rate. It goes without saying that sample rate conversions should not be used with these professional formats. Virtually identical multi-client capabilities are available for both playback and recording. Multi-client operation during recording is considerably less demanding from the vantage point of the EWS MIC 2/8 FW driver, as naturally no mixing is required. The following flow chart is exemplary for playback.



Multi-client flow chart for playback

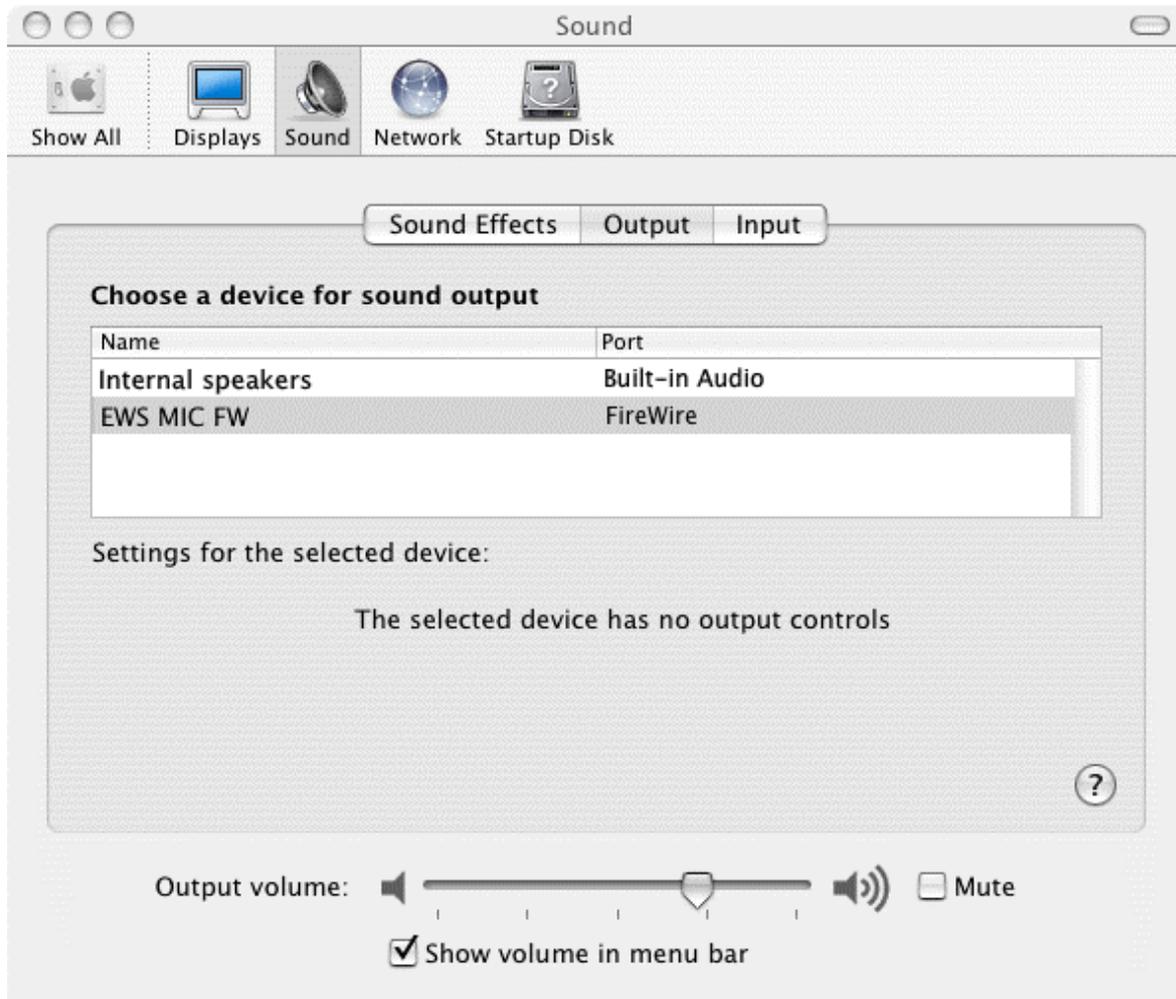
The MIDI drivers

Two separate interfaces with their own drivers are available for recording and playback of MIDI information via the MIDI IN and OUT sockets. The drivers designated as “EWS MIC FW(x) Midi In/Out” or “EWS MIC FW(x) Midi In/Out [2]” in this system can be selected in any situation in which their use would be appropriate.

Practical tip: If MIDI files, which can be played back using Windows' media players, are also to be transferred to externally connected devices, open the “Sounds and Multimedia Properties” dialog window from the Windows Control Panel and set the “MIDI Music Playback” device to the driver mentioned above.

The Mac OS X drivers

In OS X (currently OS 10.3.6), the EWS MIC 2/8 FW system is supported completely by Apple CoreAudio and CoreMIDI. Device-specific drivers are not required. The EWS MIC 2/8 FW can be selected as the default recording and playback device in “Control Panel ->Sound”.



The EWS MIC 2/8 FW as the default device in OS X

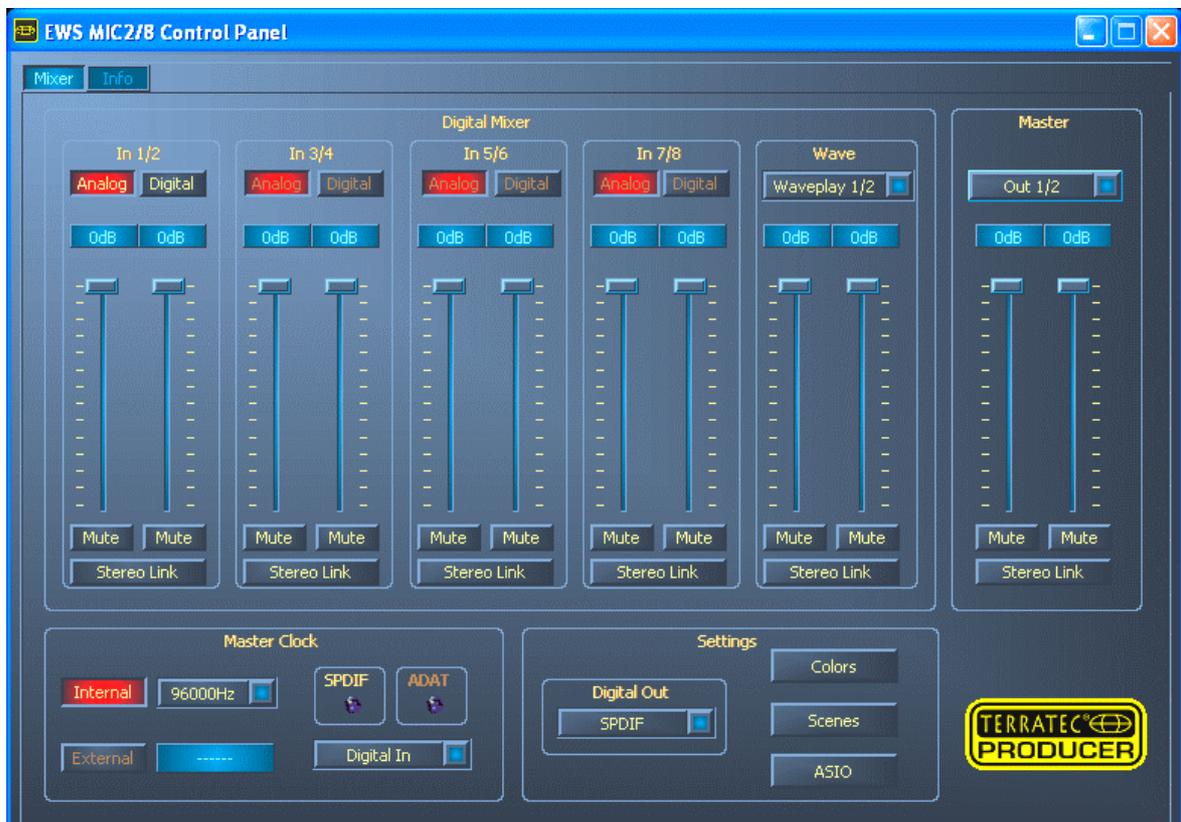
The CoreAudio/MIDI driver can also be selected in audio applications such as Cubase SX or Emagic Logic. Buffer sizes generally can also be configured there to accelerate access to the audio system. The latency under CoreAudio is comparable to the latency typical for Windows or OS9.

The EWS MIC 2/8 FW Control Panel

The EWS MIC 2/8 FW Control Panel provides access to the system's advanced functions. These include access to the hardware mixer, switching of external clock sources and selecting the sample rate.

Note: the functions and the position of the control elements are as identical as possible under Windows and Mac OS. The following illustrations correspond to the Windows version of the Control Panel.

The Control Panel is quite intuitive and should not present beginners with major problems. Nevertheless, the following section contains a number of explanations of the individual function blocks.

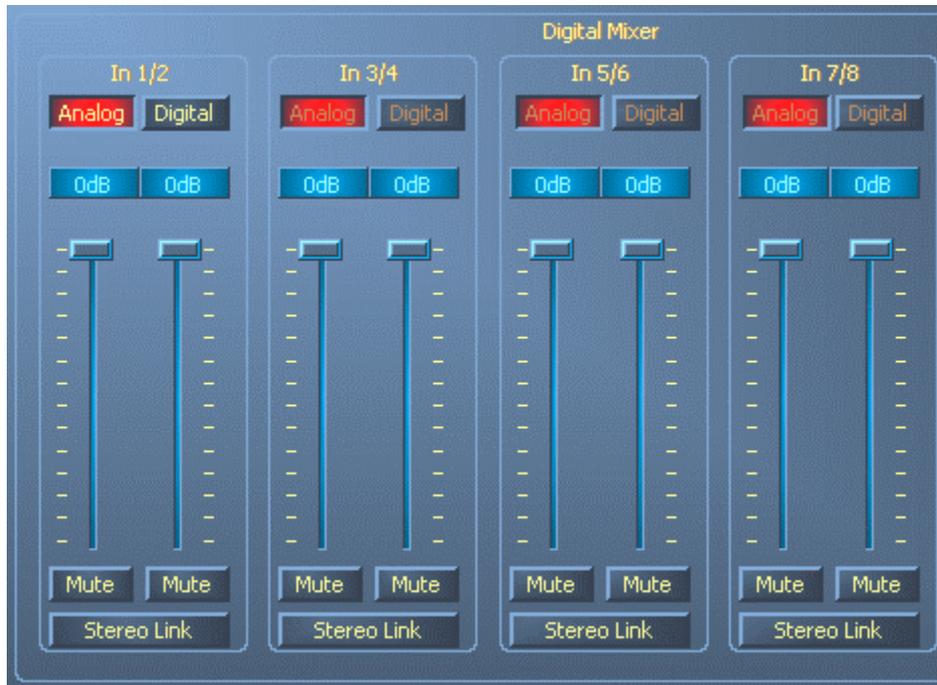


Overview of the EWS MIC 2/8 FW Control Panel.

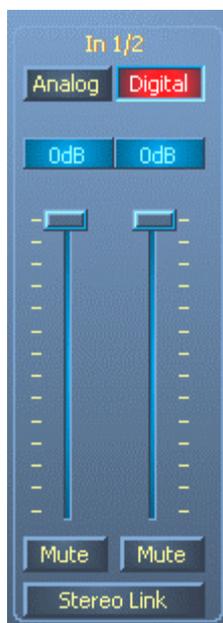
The hardware digital mixer

All analog and digital input channels of the EWS MIC 2/8 FW can be controlled by the digital mixer. The individual sliders control the relative levels (volume) of the individual channels within the mix. Logically, the signals from the analog inputs are already available in digital form at the mixer. The levels of the analog signals are adjusted manually using the gain controls on the 19" module before the signals are converted. A separate fader is available in the digital mixer for each mono channel. The individual channels can be joi-

ned in pairs using the switchable stereo link function. The “Mute” buttons can be used to mute the respecting channels.



All analog inputs are available at the digital mixer.



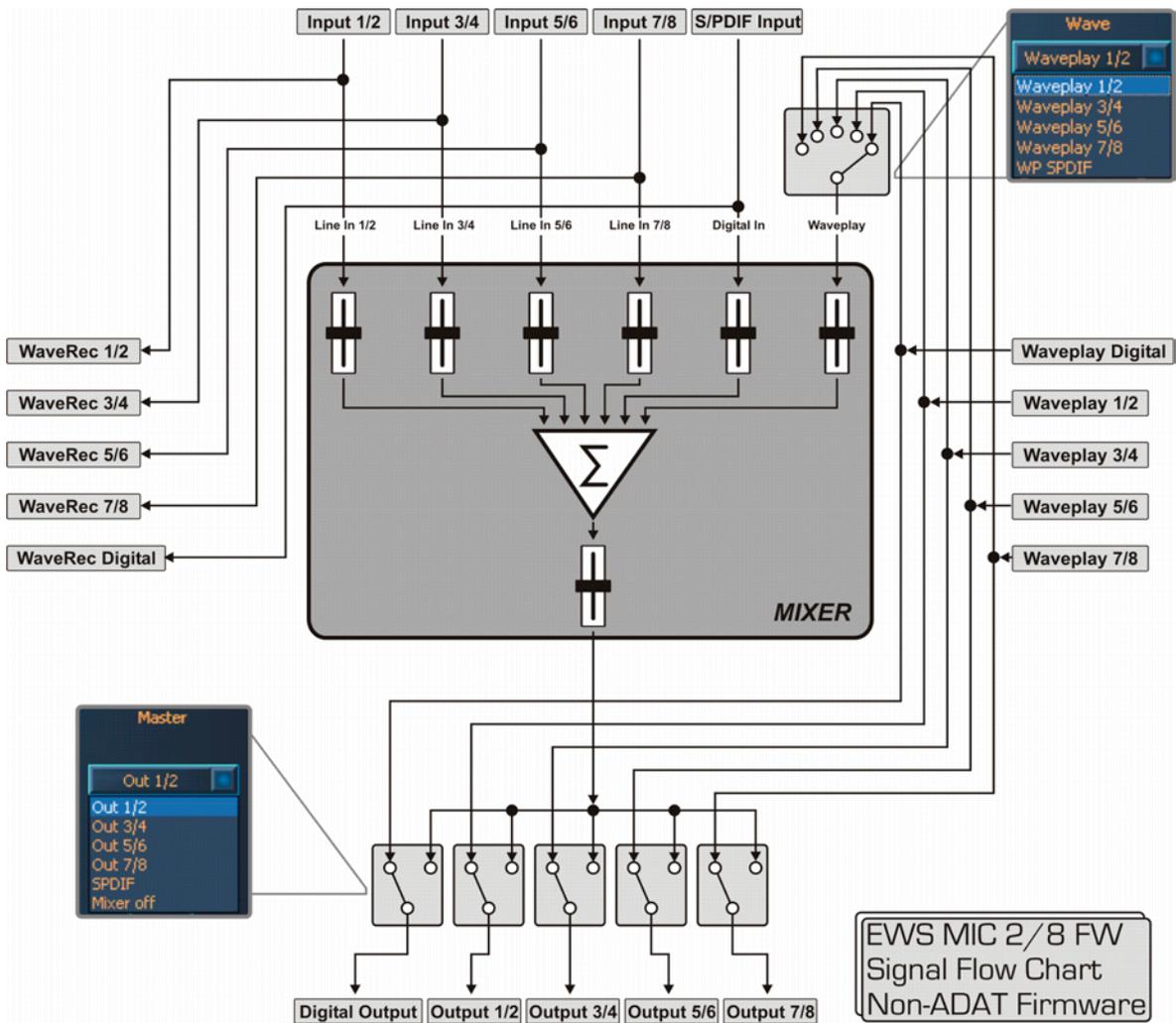
One stereo S/PDIF channel is available in non-ADAT mode. This “Digital In” channel can be selected in the “In 1/2” channel field.



In addition, a choice of waveplay stereo signals can be applied to the mixer and controlled.



Level, panorama and mute controls are also available for the mixer's master output. The EWS MIC 2/8 FW outputs available for the mixer output can be selected above the fader. The waveplay stereo channel assigned to the output by default will be switched off.

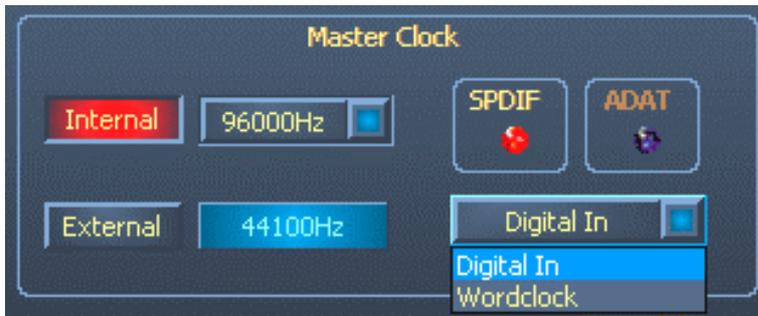


Use the mixer for virtually latency-free monitoring of the input channels, routing of wave-play stereo channels to any digital or analog output, etc.

Note: If you are working with common audio/MIDI sequencers, you should also use this software for volume control. The advantage: the settings are usually saved together with your project (song, arrangement etc.).

Master Clock

Here we're dealing with the sample rate used by the EWS MIC 2/8 FW. This is a very important point, as the card can be clocked by an external signal (External, e.g. from a DAT recorder) or it can set a sampler rate itself and provide this signal to other devices.



When set to “Internal”, you have the choice of all commonly-used sampler rates from 32 to 96 kHz. ADAT firmware supports a maximum sampler rate of 48 kHz—the bit rate is not relevant in this case. The

external sample rate, when applicable, is displayed in the box next to “External”. S/PDIF, ADAT and Word Clock signals can be used as external clock sources, depending on what you intend to synchronize your system with. If a valid S/PDIF or ADAT signal is present, the relevant virtual control lamp will be lit. If Word Clock is selected as the external source, this will be signaled by the “Word-Clk” LED on the rear panel of the 19” module. If a digital S/PDIF or ADAT signal is also present, you must ensure that the source is synchronized to the same Word Clock signal, of course. If “Digital In” is selected as the external clock source, the system will attempt to synchronize to S/PDIF or ADAT, depending on the format being applied to the optical input. Select the clock source in the field next to the one displaying the external sample rate. If no signal is available or the connection has been interrupted, the message “-----” will be returned.

The “Digital Out” selection field



When using the EWS MIC 2/8 FW system with ADAT firmware, use this field to specify whether the digital output should be in 8-channel ADAT or stereo S/PDIF format. In non-ADAT mode, S/PDIF is the only available option.

The ASIO ControlPanel

Programs that support Steinberg's ASIO feature dialogs containing special settings for these drivers. The properties of the EWS MIC 2/8 FW hardware can be set up in the ASIO Control Panel. The ASIO latency (in ms) has a direct effect on the processing

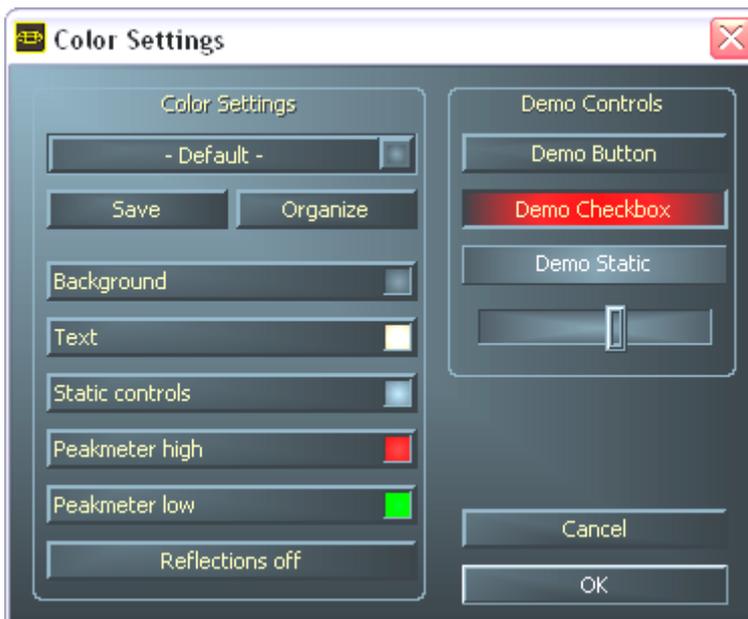


speed of the ASIO driver; if the value is too low it may impair the overall performance of your system, however. With a fast system, you should achieve values of less than 7ms without problems. “Without problems” means

that you will not detect any dropouts during audio recording or playback. If such dropouts occur, increase the latency.

Color settings

When it comes to the design of the Control Panel, we like things to be clean and functional. We don't want to force anything onto you, however—feel free to brighten your screen with the Color Panel.

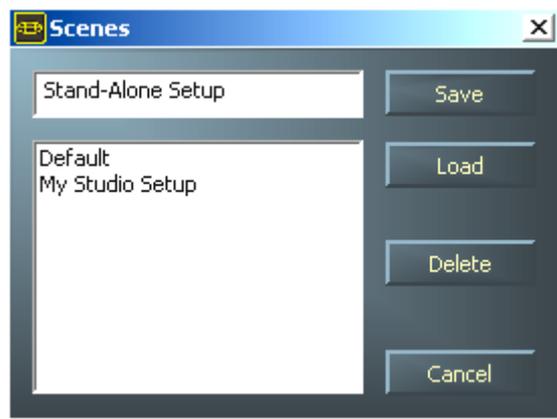


You'll also find a number of truly useful controls here that will not only beautify the Control Panel, but also improve the overview. Click the Background, Text, Static Controls and Peakmeter buttons to open the Windows custom color dialog box. The “Reflections off” option disables the attractive Windows reflections of the elements. Test the settings made above in the right-hand

part of the window and save them when you're satisfied. Once saved, you can find your personal color settings in the dropdown menu, which already contains a number of examples. The “Windows System” color set uses only colors that display correctly at an 8-bit color depth.

Scenes and stand-alone mode

Faced with such a wealth of settings, it would be pretty tedious to have to set things up by hand every time. Needless to say, you can count on us to make your life easier with our



extremely practical “Scenes” menu item. Simply save all of your control and fader settings at the click of a button and reload them whenever you need them. And that’s not all: you can also use the EWS MIC 2/8 FW in stand-alone mode as a high-quality A/D or D/A converter. The values last saved in the Control Panel will be called up automatically whenever the 19” module is powered up without a connection to the

computer.

Notes on stand-alone mode with non-ADAT firmware:

If the output of the digital mixer is not routed to the S/PDIF output, the analog inputs 7 and 8 will always be applied to it (MIC INs to S/PDIF Out).

If the output of the digital mixer is not routed to outputs 1/2, the S/PDIF input will be applied to them (S/PDIF IN to Master Out 1/2).

Notes on stand-alone mode with ADAT firmware:

All analog inputs 1-8 will be routed to the ADAT outputs 1-8.

All ADAT input channels 1-8 will be routed to the analog outputs.

If the output of the digital mixer is routed to an analog or digital output, this routing will have priority.

Info

The About page of the EWS MIC 2/8 FW Control Panel gives you all of the relevant facts on your Control Panel, audio drivers, firmware version and operating system.



Note: you can select the contents with your mouse and copy it to the clipboard—a convenient feature for a quick description of your system for support requests.

Tips, tricks & things worth knowing.

Always right on time—digital synchronization.

When recording with the digital interface, make sure that the sampling frequency (rate) of the card matches that of the device from which you are recording. To ensure correct synchronization of the devices, you must switch the MasterClock to “External” in the Control Panel (see also page ↻ 31).

If you forget this step, audible errors such as dropouts and clicks may occur during recording—and already when monitoring the signal. And also in the reverse situation (an external device should run at the same rate at the audio system), make sure that settings of your additional peripherals match. The Control Panel must be set to “Internal” in this case (such as during operation without externally connected 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 interface of the EWS MIC 2/8 FW audio system transfers all bit resolutions between 8 and 24 bits and all sampling rates between 8 and 96 kHz. Please note that not all devices can process sample rates higher than 48 kHz. To transfer a signal recorded at 96 kHz to a DAT recorder, it's necessary to use suitable software to convert the file(s) to 44.1 kHz or 48 kHz first.

Useful information about digital cables (optical waveguides and AES/EBU).

Even when transmitting audio data via optical fibers, a few, usually inaudible, errors may occur. You should nevertheless choose high-quality cables that are not excessively long: flexible plastic cables of up to 1.5m, or (less flexible) glass fiber cables of up to 5m length.

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 losses are usually so minimal that you need to be careful not to mix up the myth with the reality.

Devices with AES/EBU interfaces cannot normally be used on S/PDIF interfaces. 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.

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 ensure the correct synchronization of the devices, switch the master clock to “External” in the Control Panel (exception: the S/PDIF can be synchronized via the Word Clock interface, but this is rather rare in practice).

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 audio system). In that case, set the EWS 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 EWS MIC 2 and MIC 8 FW support all bit resolutions between 8 and 24 bits, as well as all sample rates between 32 and 96 kHz. Please note that not all devices can process sample rates higher than 48 kHz. To transfer a signal recorded at 96 kHz to a DAT recorder, it's necessary to use suitable software to convert the file(s) to 44.1 kHz or 48 kHz first.

Dolby AC3 and DTS.

The digital interfaces of the EWS MIC system can also be used independently of the ADAT or S/PDIF standards (S/PDIF-Out to “Non-Audio”). Various manufacturers of software DVD players support the playback of DVD audio material via the audio systems by TerraTec. Signals in Dolby AC3 or DTS format can therefore also be transferred using the digital interfaces.

Useful information about digital cables (optical waveguides and AES/EBU).

Even when transmitting audio data via optical fibers, a few, usually inaudible, errors may occur. You should nevertheless choose high-quality cables that are not excessively long: flexible plastic cables of up to 1.5m, or (less flexible) glass fiber cables of up to 5m length.

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 losses are usually so minimal that you need to be careful not to mix up the myth with the reality. In case this topic interests you, there are a number of entertainingly militant Internet newsgroups devoted to it ;-).

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.

Technical data.

19" module

- External 19" module with integrated power supply and automatic voltage/frequency adaptation (240V/115V – 50Hz/60Hz)
- Integrated ADAT™ interface (TOS-Link, light pipe)
- FireWire™ interface 24-bit/96 kHz interface
- 24-bit/96 kHz A/D converter with 108 dB (A) SNR*, 106 dB(A) typical @ 48 kHz
- 24-bit/96 kHz D/A converter with 110 dB (A) SNR*, 109 dB(A) typical @ 48 kHz
- 8 analog inputs, balanced (XLR-1/4" jack combination socket)
- Line/instrument input range: -17.8 dBu (100 mV) to +15 dBu (4.35 V)
- Microphone input range: -37 dBu (10 mV) to +17 dBu (5.5 V)
- 8 analog outputs, balanced (1/4" jack)
- Output range: +4dBu (max. 20 dBu) / -10 dBV (max. 6dBu), globally switchable
- 8 gain controllers on the front for setting levels for analog inputs (20/60 dB range)
- 8 blue input signal and 8 red clipping LEDs (clipping at -1dB) on the front panel
- Line/instrument input impedance, 100 kOhm (unbalanced), 200 kOhm (balanced)
- Microphone input impedance: 10 kOhm
- Output impedance: 75 Ohm
- 2 XLR/jack Mic INs on the front panel as alternatives to inputs 7 and 8 (auto priority)
- Inputs switchable between microphone and line/instrument levels
- 8 (MIC2: 2) high-quality Class A microphone preamplifiers, developed in partnership with SPL Germany
- Direct-Out switch for all analog channels on the front panel
- Phase, low-cut (subsonic filter) and mute switch for each channel
- Low-cut at 50 Hz, 40 dB / octave
- Switchable 48 V phantom power for all microphone inputs
- Headphone output on front panel/DAC/amplifier to monitor output signal
- TOS-Link interface for ADAT™ and S/PDIF formats
- 2 separate MIDI interfaces with a total of 32 channels
- WordClock I/O BNC with autodetection
- Ground Lift switch
- Flexible connection options: FireWire™ and/or ADAT

-
- MIC2 and MIC8 can also be used without a PC (as microphone preamp, ADAT-AD/DA interface, DI box, etc.)
 - Stand-alone mode without computer as digital mixer, microphone preamp ADAT AD/DA interface, etc.
 - 44.1 kHz / 48 kHz switcher when master in stand-alone mode
 - Auto-slave when a valid external clock is recognized in stand-alone mode (with auto-priority: 1. Word Clock, 2. ADAT/SPDIF)
 - Word clock I/O with "Signal Present" LED
 - Non-audio mode for transmitting AC3/DTS streams via digital interface
 - 4 meter FireWire™ connecting line to MIC module
 - Weight: 3.435 kg
 - Dimensions: 482 x 44 x 245 mm

*) This information refers to the technical data of the converters used.

FireWire™ Interface

- IEEE-1394-compliant interface for PC/Mac (FireWire™)
- 2 high-speed FireWire™ ports
- Advanced DSP hardware monitor-mixer
- Max. 16 inputs and 16 outputs total
- Non-audio mode for transfer of AC3 or DTS signals via the digital output
- 4 m IEEE 1394 FireWire™ cable

Software

- Multiplatform (Mac and PC)
- WDM driver for Windows
- Core Audio and Core MIDI support from OS X10.3.6
- ASIO 2.0 and GSIF (GigaStudio) support for all inputs and outputs
- ASIO/GSIF/WDM (MME and DirectSound) multi-client mode
- WDM kernel streaming (e.g. for Sonar™)
- MME and DirectSound support
- Control Panel for Windows XP and Mac OS X
- Firmware versions: 10-channel 24/96 non-ADAT or 16-channel 24/48 ADAT
- Firmware update tool for PC and Mac

PC system requirements

- Pentium III 800 or higher
- 128 MB RAM
- Windows XP from service pack 1 (SP1)

PC system recommendation

- Intel Pentium 4 2 GHz, Celeron 2GHz or AMD AthlonXP 2000 2 GHz
- 512 MB RAM
- Windows XP with Service Pack 1 (SP1) or higher

Mac system requirements

- G4 800 MHz
- 256 MB RAM
- MAC OS X 10.3.6 or higher

Mac system recommendation

- G5 1.8 GHz
- 512 MB RAM
- MAC OS X Panther 10.3.6 or higher

Measurements:

- Rohde & Schwarz Audio Analyzer 10 Hz ... 110 kHz. UPL
- Calibration: 02.07.2002, Re-No.: 900229/000
- Input voltage: +4dBu, gain setting to achieve 0 dBu FS

D/A Conversion - WavePlay at 48 kHz

- Dynamic Range: 109,59 dBr (A-weighted),
- THD +N: -102.91 dBr

D/A Conversion – WavePlay at 96 kHz

- Dynamic Range: 102,30 dBr (A-weighted)
- THD +N: -99,10 dBr

A / D Conversion – WaveRec at 48 kHz Sample-Rate

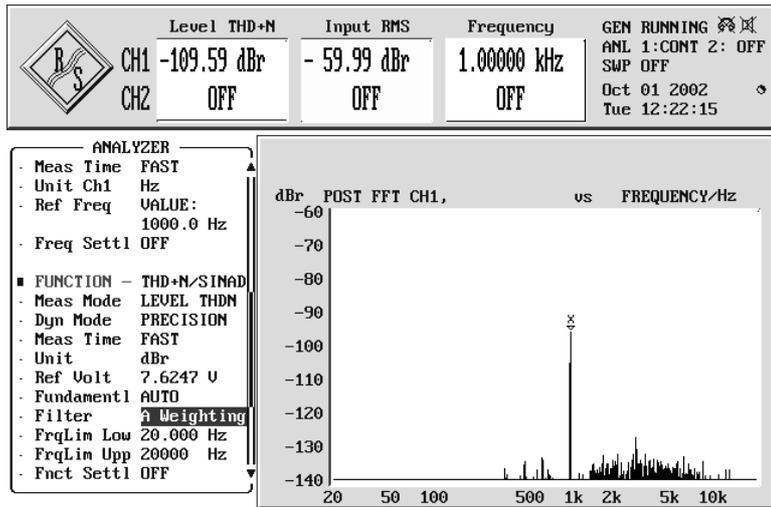
- Dynamic Range: 106,21 dBr (A-weighted)
- THD +N: -99.96 dBr

A / D Conversion – WaveRec at 96 kHz Sample-Rate

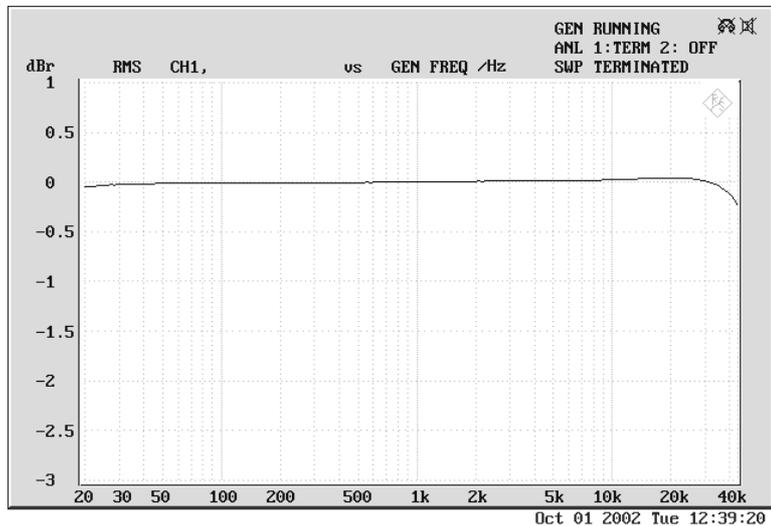
- Dynamic Range: 102,30 dBr (A-weighted)
- THD +N: -99,10 dBr

Microphone Input – A/D Conversion at 44,1 kHz

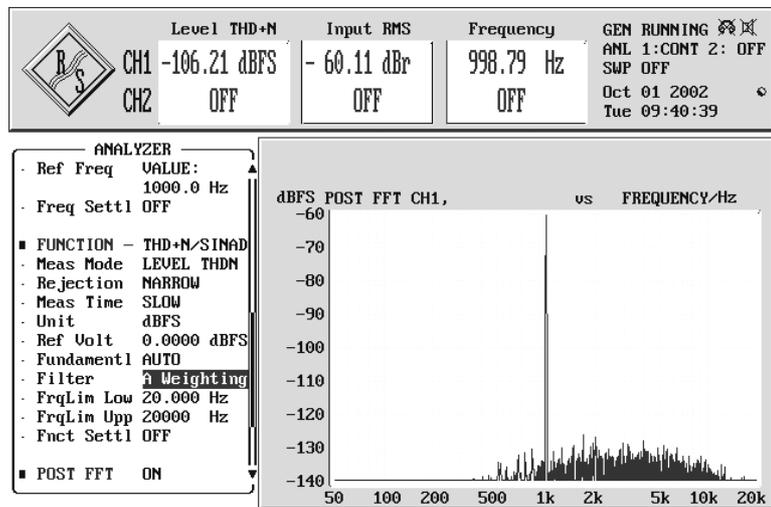
- Dynamic Range: 105,99 dBr (A-weighted)
- THD +N: -99,30 dBr



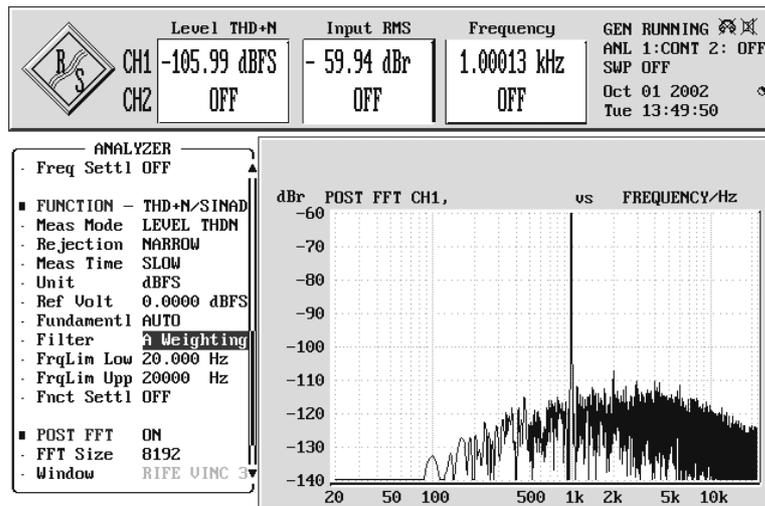
THD+N (Total Harmonic Distortion + Noise) – D/A conversion, WavePlay at 48 kHz



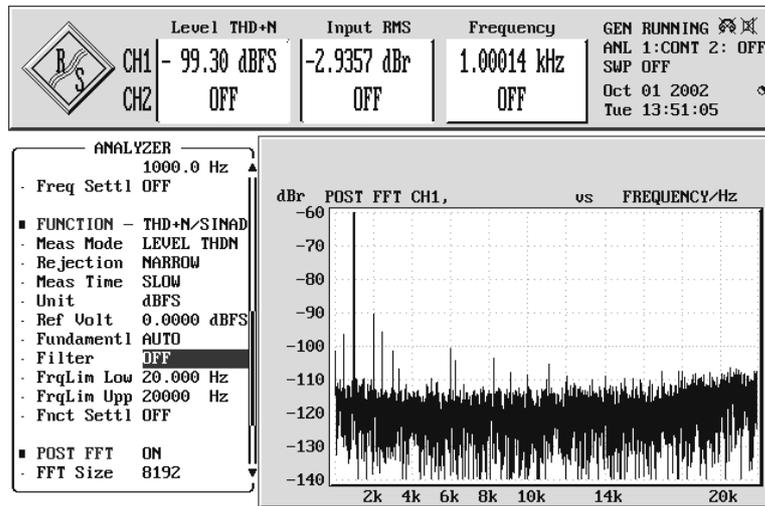
Frequency Response – D/A conversion, WavePlay at 96 kHz



Line/Instrument Input Dynamic Range – A/D conversion, WaveRec at 48 kHz



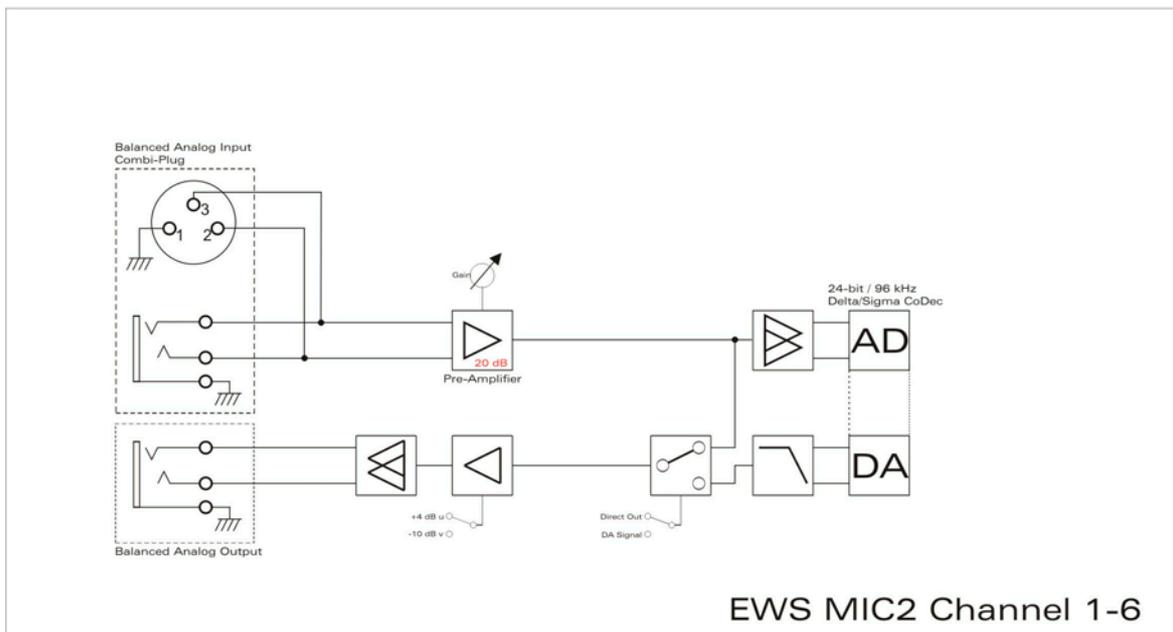
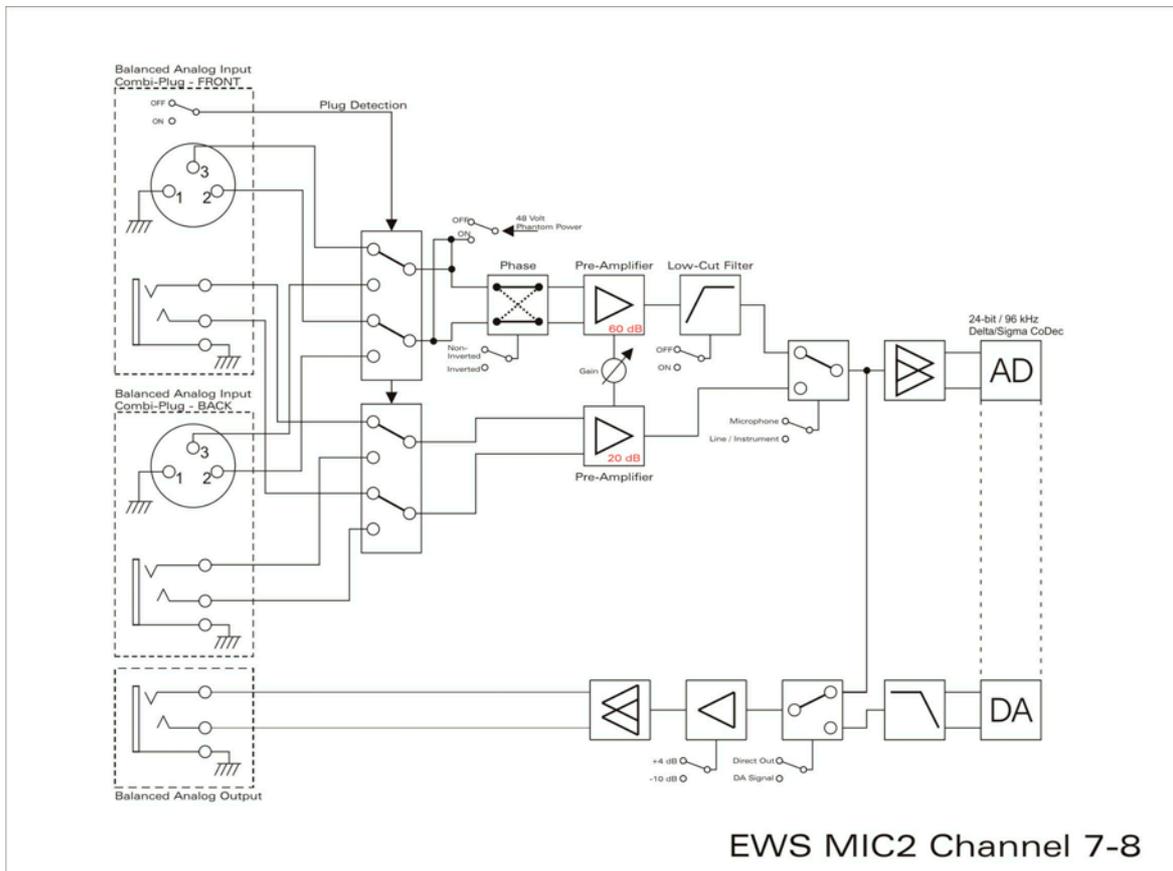
Microphone Input Dynamic Range – A/D conversion, WaveRec at 44,1 kHz



Microphone Input THD + N – A/D conversion, WaveRec at 44,1 kHz

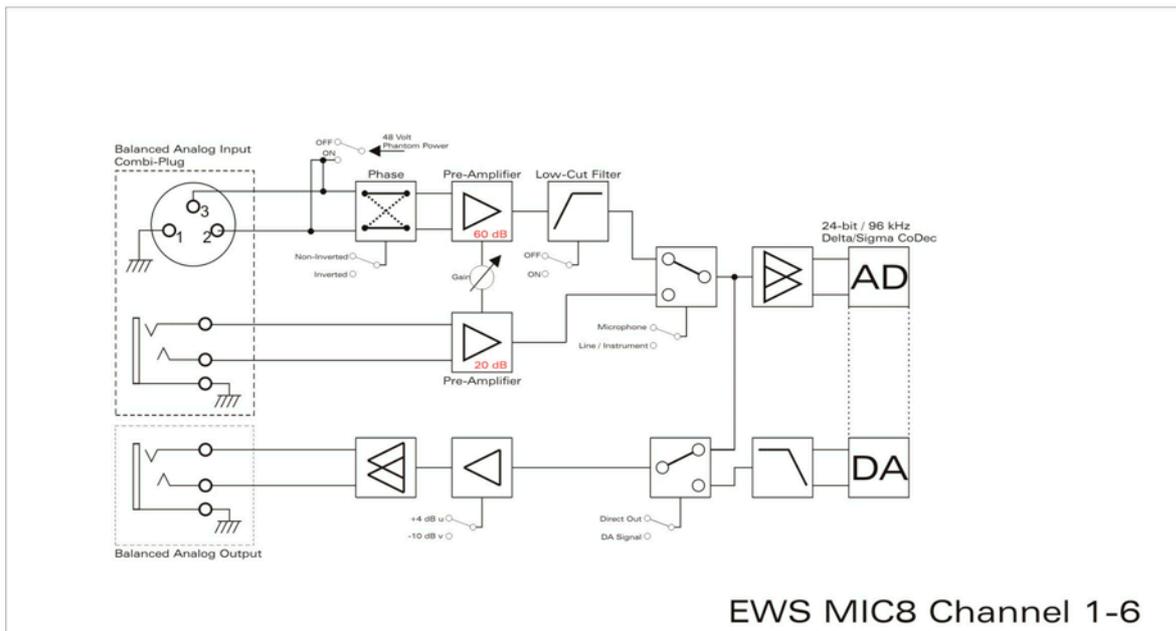
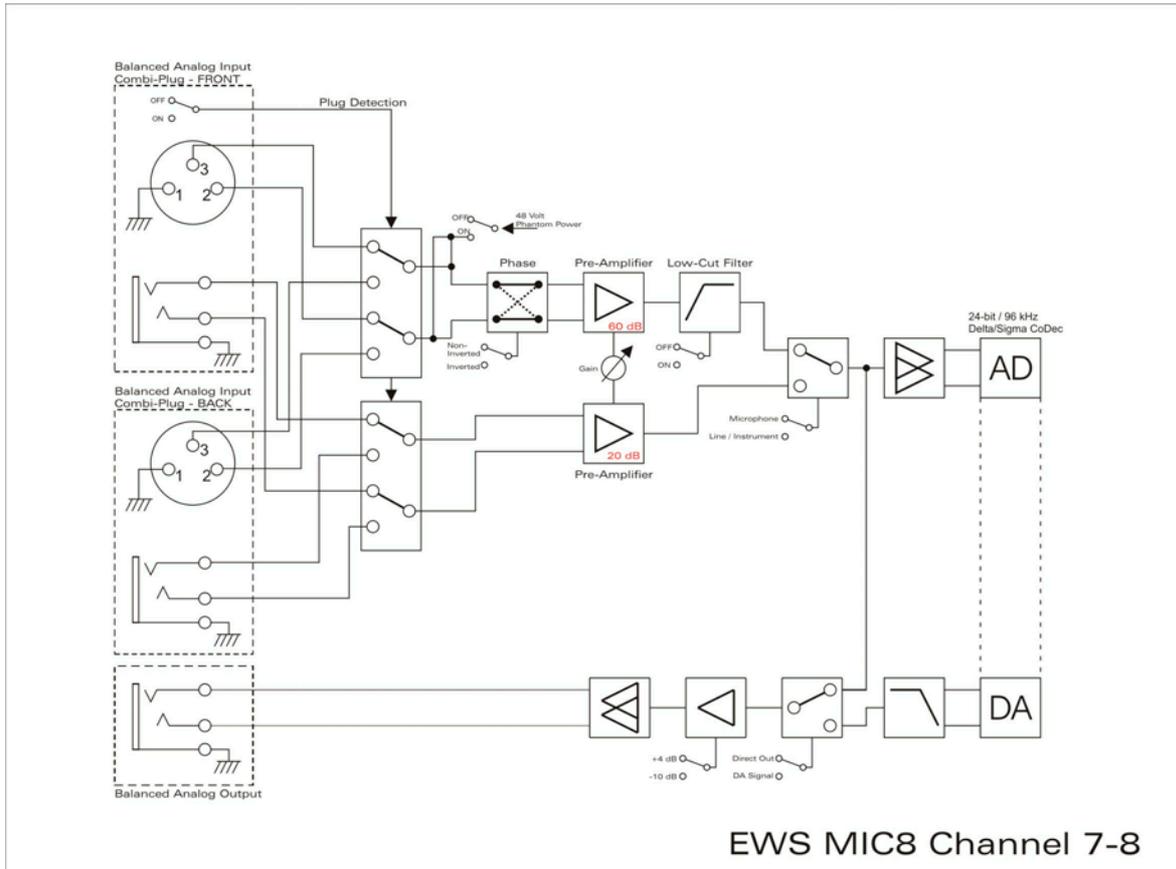
Appendix

Block diagram: EWS MIC2 analog section



EWS MIC2 Analog Section

Block diagram: EWS MIC8 analog section



EWS MIC8 Analog Section