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V2 JULY 2005

1. Introduction

Thank you for choosing the ESI MaXiO.

The MaXiO System Manual covers the MaXiO PCI host card and all extensions such as the EX8000 rack unit and the MaXiO 032 breakout box.

MaXiO XD is a complete 24-bit / 192 kHz recording system designed to handle up to 32 input channels and 32 output channels simultaneously.

The basic MaXiO XD system consists of the MaXiO PCI host card and one EX8000, a 2U-rack space unit with 8 analog input channels, 8 analog output channels, ADAT, and digital I/O. The PCI card is equipped with four FireWire-like E.D.I (ESI Digital Interface) ports, each capable of individually supporting one breakout box with E.D.I connection like the EX8000.

There is also a single M.D.I (Multiple Digital Interface) multichannel connector on the PCI host card for future expansion. This gives the MaXiO XD system 32 input and 32 output channel capability on one single interface card. By default, the M.D.I connection of the MaXiO PCI host card provides coaxial S/PDIF I/O, Word Clock I/O and a 1 in / 1 out MIDI interface.

Another member of the MaXiO series, the MaXiO 032's 4 ADAT inputs and 4 ADAT outputs provide 32 input and 32 output channels, via a single PCI card and its breakout box. Now you can connect your computer to up to 4 ADAT compatible devices and use them simultaneously for multi track recording.

There is more: next to S/PDIF I/O and a full 16 channel MIDI interface MaXiO 032 provides a high quality stereo analog input with microphone preamps (48V phantom power support), a high end 123dB[A] ADC, and 120dB[A] DAC. This turns MaXiO 032 into a reference audio hardware providing audio quality at a level that has not been achieved before in this price range.

The MaXiO 032 can be expanded via its E.D.I (ESI Digital Interface) connectors into a full MaXiO XD system by adding one or several EX8000 units.

On PC systems, MaXiO systems are equipped with ESI's unique and powerful EWDM driver for perfect compatibility with Windows XP and 2000, offering ultra low-latency performance with all popular digital audio software applications including Nuendo, Cubase, Gigastudio, Cakewalk, Sonar, Logic, Samplitude and Sequoia.

1.1 About this manual

The MaXiO XD system and MaXiO 032 are very flexible and provides a huge number of features and options. In order to use it to its full capabilities, you need to understand the usage and concepts. We know that most users do not like to read long manuals such as this (we don't like it either ...) – because of that, we have tried to keep this manual as short as possible. Please take your time to read it completely.

1.2 What's in the Box?

Your MaXiO XD package contains the following:

- · MaXiO PCI host card
- · Driver CD with UAT bundle software
- · Tracktion Software CD
- · MaXiO System Manual (this document)
- · M.D.I breakout cable
- · standard IEEE1394 connection cable
- · EX8000 2U rack
- · power cable for EX8000
- · EX8000 User's Guide

Your MaXiO 032 package contains the following:

- · MaXiO PCI host card
- · Driver CD with UAT bundle software
- · Tracktion Software CD
- · MaXiO System Manual (this document)
- · The M.D.I connection cable (between MaXiO PCI host card and MaXiO 032 breakout box)

1.3 Key Features

1.3.1 MaXiO PCI host card

- · 32bit PCI Interface with PCI Bus-Mastering support
- · PCI slot compatibility – designed to suit +3.3V and/or +5V PCI slots
- · 24bit /192 kHz audio interface
- · maximum 32 input and 32 output channels
- · Full Duplex – simultaneous record / playback
- · 4 E.D.I & 1 M.D.I connectors
- · Coaxial digital I/O support up to 24-bit / 192 kHz (built on M.D.I breakout cable for MaXiO XD only)
- · Word Clock I/O: Fs / 256*Fs, BNC connector (built on M.D.I breakout cable for MaXiO XD only)
- · 1 in / 1 out, 16 channel MIDI (built on M.D.I breakout cable for MaXiO XD only)
- · Supports EWDM driver: MME/WDM, DirectSound, ASIO 2.0, GSIF
- · Windows ® XP/2000 compatible

1.3.2 EX8000 2U Rack

- · E.D.I Connector
- · High-end quality 24-bit / 192 kHz ADC with 123dB(a) dynamic range

· High-end quality 24-bit / 192 kHz DAC with 120dB(a) dynamic range
· 8 balanced analog inputs with combo (XLR / TRS) connectors featuring ESI's newly developed 'XD-PRE' high precision & ultra low noise (-135.5dBu) microphone preamplifier on each analog input channel with support for +48V phantom power
· Mic/Line selection switch and gain control for each analog input channel
· 8 inserts (one for each analog input channel) with 1/4" connectors
· 8 balanced analog outputs with XLR connectors (+4dBu)
· 8 balanced/unbalanced analog outputs with TRS connectors (-10dBV)
· Headphone amplifier with volume control
· 8 channel digital I/O in AES/EBU (XLR connectors) and coaxial S/PDIF (RCA connectors) format, supporting up to 24-bit / 192 kHz
· 8 channel ADAT optical digital I/O with S/MUX support
· 10 step LED level meters on front panel for all channels (input and output)
· Supported sample rates: 44.1, 48, 88.2, 96, 176.4 and 192 kHz
· Word Clock input: Fs / 256*Fs (via BNC connector)

1.3.3 MaXiO 032 breakout box

· M.D.I connector
· High-end quality 24-bit / 192 kHz ADC with 123dB(a) dynamic range
· High-end quality 24-bit / 192 kHz DAC with 120dB(a) dynamic range
· 2 balanced analog inputs with combo (XLR / TRS) connectors featuring ESI's newly-developed 'XD-PRE' high precision & ultra low noise (-135.5dBu) microphone preamplifier on each analog input channel with support for +48V phantom power
· Mic/Line/Hi-Z selection switch and gain control for each analog input channel
· 2 balanced analog outputs with XLR connectors (+4dBu)
· 2 balanced/unbalanced analog outputs with TRS connectors (-10dBV)
· Headphone amplifier with volume control
· 2 channel digital I/O in coaxial S/PDIF (RCA connectors) format, supports up to 24-bit / 192 kHz resolution/sample rate
· 32 channel ADAT optical digital I/O
· Supported sample rates: 44.1, 48, 88.2, 96, 176.4 and 192 kHz
· Word Clock input and output: Fs / 256*Fs (via BNC connector)
· 1 in / 1 out, 16 channel MIDI

2.1 MaXiO PCI host card
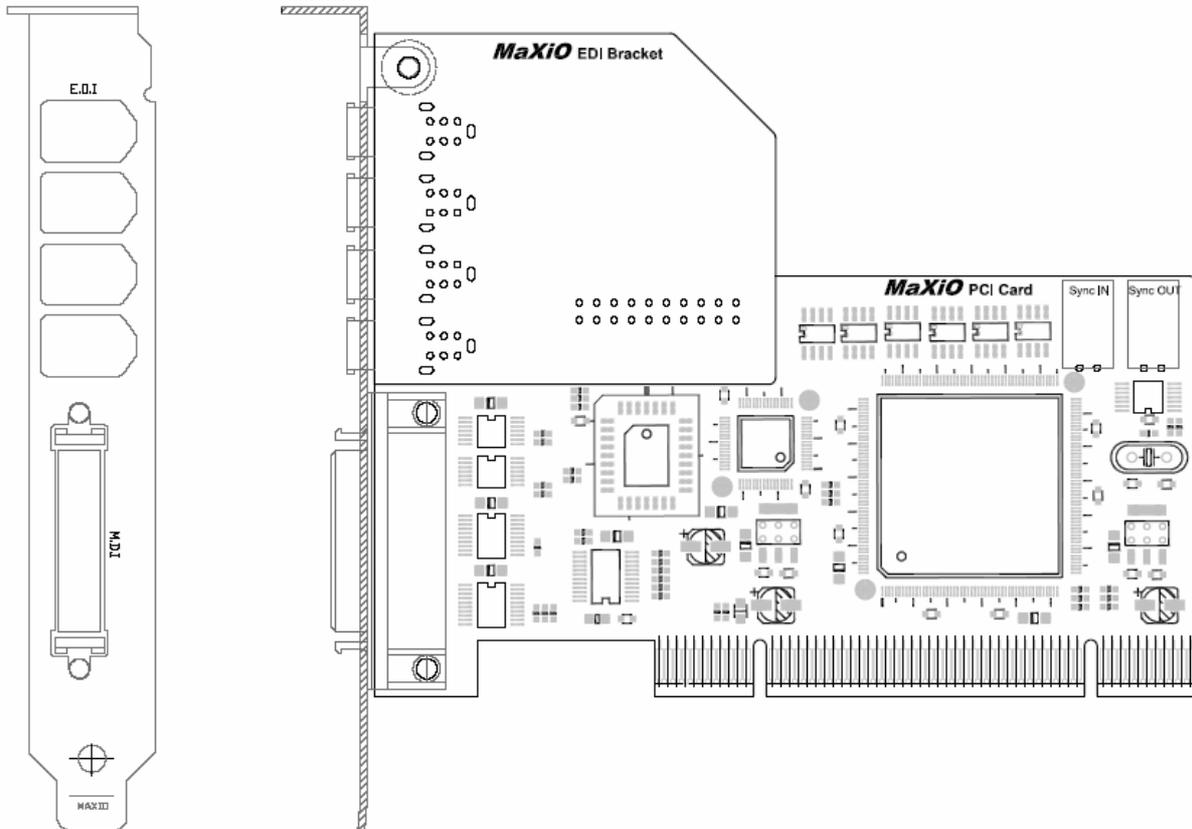

2.1.1 E.D.I connector

E.D.I is ESI's exclusive digital audio transfer protocol that delivers an 8 channel audio stream (with up to 24-bit / 192 kHz). E.D.I uses an IEEE1394/FireWire cable for the connection of E.D.I compatible devices like EX8000 to the MaXiO PCI host card. The PCI host card has 4 E.D.I connectors that allow you to connect 4 devices such as EX8000 simultaneously, providing 32 input and 32 output channels.

2.1.2 M.D.I connector

The M.D.I connection can handle 32 digital input and 32 digital output streams for the extension of MaXiO 032 breakout box.

* In the basic MaXiO XD system, the MaXiO PCI card connects to the special M.D.I breakout cable (described below).

2.2 EX8000
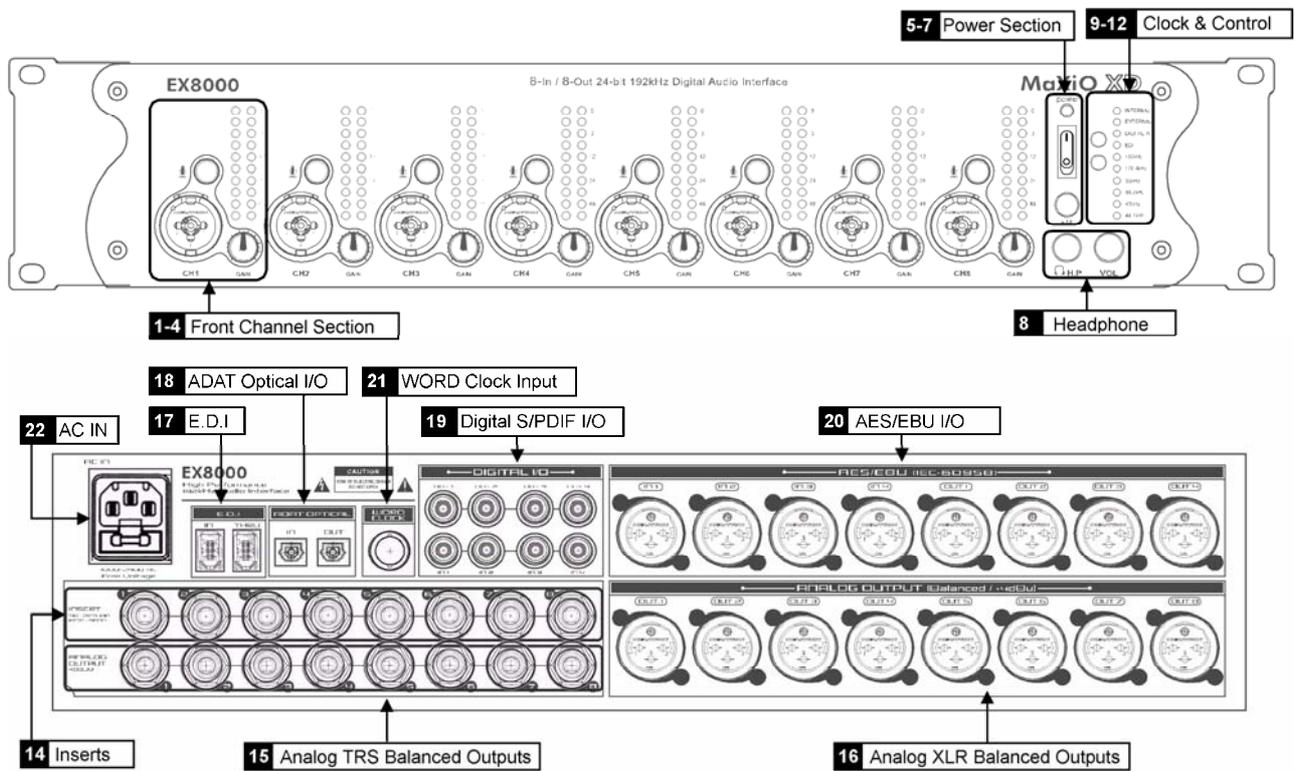
2.2.1 Front Panel Input Channel Section

**1**   Analog Balanced XLR / TRS (Combo) Input Connector

EX8000 provides 8 combo connectors (XLR and 1/4" TRS) on the front panel that are used as balanced analog inputs for line level signals and microphone connection (via XLR).

2   Microphone Input Selection Switch

Every input channel can be used for line level or microphone signals. When this switch is enabled, a microphone can be connected via XLR. In this case phantom power is supplied (when enabled, check **7**). When the switch is not enabled, the XLR and TRS inputs are used for balanced line level signals.

3   Input Gain Control

Controls the amount gain applied to the input signal from the XLR or TRS connector of specific channel. Microphone signals can be amplified with 48dB maximum, line level signals with up to 30dB.

4   Analog Input / Output Level Meter

The two level meters indicate the signal level for the analog inputs and outputs. The level meter on the left shows the input signal; the level meter on the right shows the output signal of the corresponding channel. A range from 0dB to 60dB in 10 dB-steps is displayed.
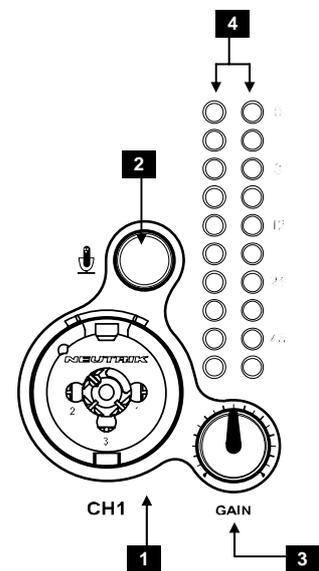
2.2.2 Front Panel Power Section

5 Power Indicator LED

6 Power Switch

7 Phantom Power Switch
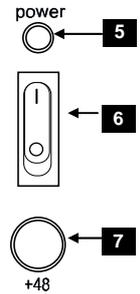
+48V DC phantom power (for balanced condenser microphones) will be supplied via every XLR input connector when this button is enabled. Note that this affects only those input channels that are set to receive microphone signals (check **2**).

⚠ **CAUTION**
· Before you turn on the phantom power switch, you must make sure to connect your microphones to the XLR inputs (with balanced cables).
· After you have turned on the phantom power switch, you should not connect or disconnect a microphone to any of the input connectors.

2.2.3 Back Panel Power Section

22 AC IN

EX8000 needs external AC power. It supports 100~240V AC (free voltage). There is a spare fuse (5X20mm Glass Fuse) below the connector.
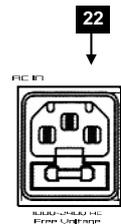
2.2.4 Front Panel Clock & Control Section

9 Clock Source Indicator

Displays the current clock source of EX8000:
- Internal: EX8000 uses its internal clock.
- External: EX8000 works with the clock from the Word Clock input.
- Digital In: EX8000 works with the clock supplied from the AES/EBU, S/PDIF or ADAT input.
- E.D.I: EX8000 works with the clock from the MaXiO PCI host card.
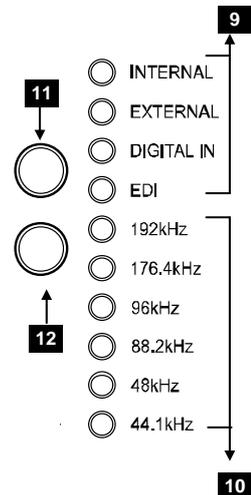
10 Clock Frequency Indicator

Displays the current sample rate of EX8000.

11 Clock Select Button 1

When EX8000 is working in stand alone mode, you can choose the clock source with this button (Internal, External, Digital In). This function is not available when EX8000 is connected to the MaXiO PCI host card.

12 Clock Select Button 2

When EX8000 is working in stand alone mode, you can choose the sample rate with this button (44.1 ~ 192 kHz). This function is not available when EX8000 is connected to the MaXiO PCI host card.

2.2.5 Back Panel Clock Section

21 Word Clock Input

The Word Clock input allows you to synchronize EX8000 with other devices. When EX8000 is connected to a Word Clock source, EX8000 will synchronize to it.
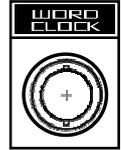
### 2.2.6 Analog Outputs & Inserts

8 Headphone

You can monitor the playback signal from output 1, 2 through the headphone output. The output level can be adjusted with the volume pot.
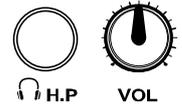
14 Inserts

The inserts allow you to use the microphone preamps of EX8000 for incoming signals, and then run the signal through external hardware processors or effects before the AD-converter digitizes the signal. In order to use the inserts, you typically need an "insert-cable" with a 1/4" TRS connector on one and two 1/4" mono connectors on the two other ends. Here is a description of the insert connector:
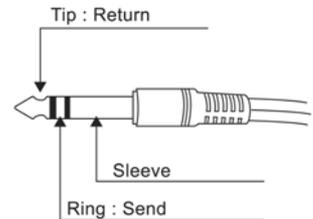
- Tip: return signal (input from effect processor)
- Ring: send (output to effect processor)
- Sleeve: common ground
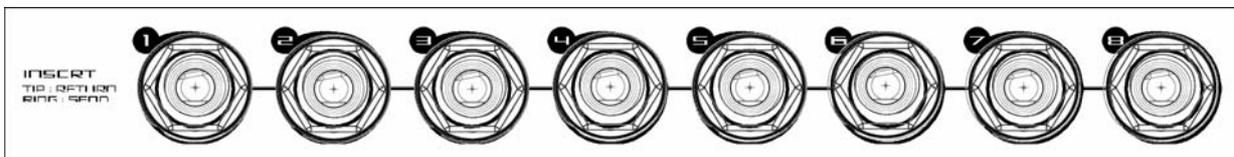
15 Analog Balanced TRS Output Connectors

EX8000 has 8 balanced/unbalanced analog outputs (-10dBV) with TRS connectors.
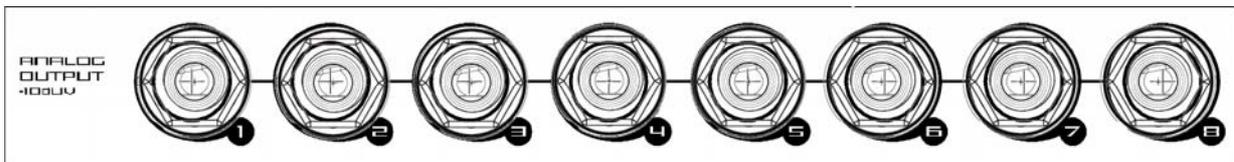
16 Analog Balanced XLR Output Connectors

EX8000 has 8 balanced analog outputs (+4dBu) with XLR connectors.
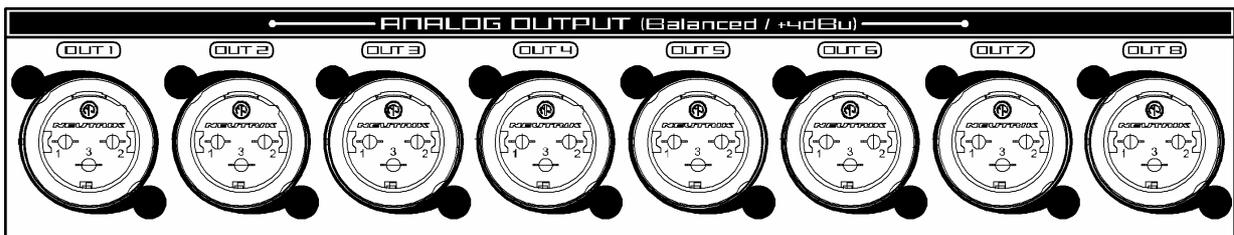
2.2.7 Digital I/O (Back Panel)

17 E.D.I Connector

E.D.I Connector IN: connection to MaXiO PCI (with a standard IEEE1394 cable).
E.D.I Connector THRU: this connector is reserved for future expansion.
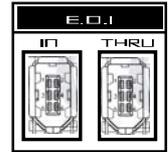
18 ADAT Optical Input / Output

EX8000 has 8 channel ADAT optical I/O connectors. You can connect EX8000 to devices such as digital mixers or ADAT multichannel recorders equipped with optical ADAT connectors. One ADAT cable transfers 8 channels with max. 48 kHz. EX8000 also supports different S/MUX modes to transfer signals with 96 kHz and above (S/MUX 2: 96 kHz, 4 channels / S/MUX 4: 192 kHz, 2 channels).
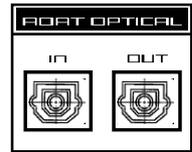
19 Digital S/PDIF (RCA) Input / Output

EX8000 has 4 S/PDIF inputs and 4 S/PDIF outputs (RCA) for coaxial digital connection.
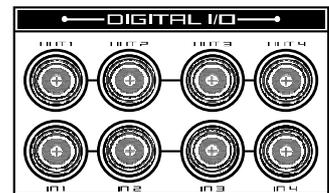
20 AES/EBU (XLR) Input / Output

EX8000 has 4 AES/EBU inputs and 4 AES/EBU outputs (XLR) for balanced digital connection.
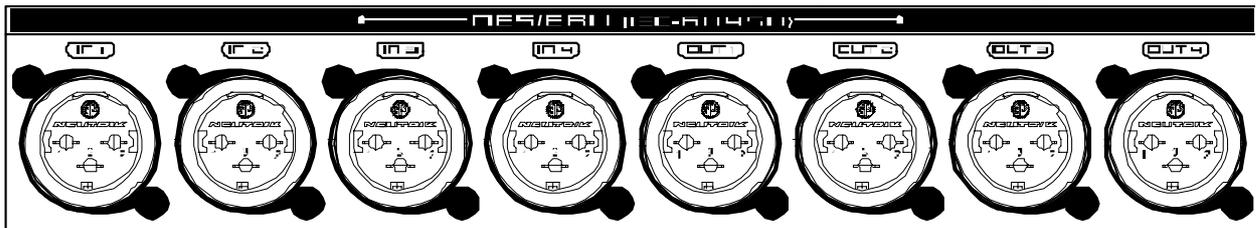
2.3 M.D.I breakout cable (for MaXiO XD only)
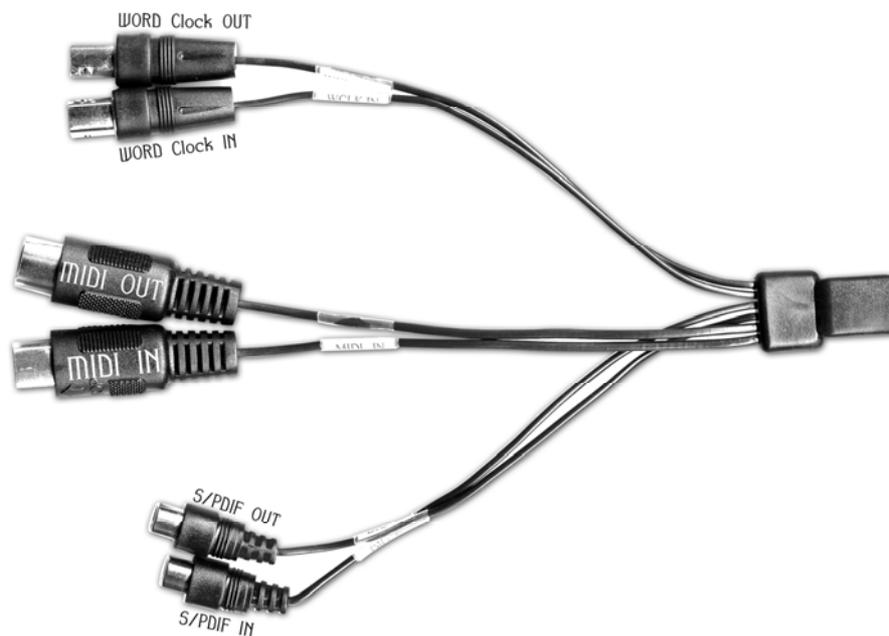
2.3.1 Word Clock I/O

This connector allows you to synchronise the MaXiO PCI host card via Word Clock (BNC) with other audio devices. You can synchronise other devices via the Word Clock output (FS / 256xFS) and you can also synchronise the MaXiO PCI host card to other devices via the Word Clock input. This is controlled via the MaXiO XD Control Panel software.

2.3.2 MIDI I/O

The MaXiO XD system also provides a MIDI interface with 1 input and 1 output (16 channels) via the M.D.I breakout cable.

2.3.3 S/PDIF Digital I/O

The MaXiO PCI host card also provides coaxial digital S/PDIF I/O connection via the M.D.I breakout cable. The supported sample rates are: 32 kHz, 44.1 kHz, 48 kHz, 64 kHz, 88.2 kHz, 96 kHz. The supported resolution is 24-bit (internal 32-bit).

2.4 MaXiO 032 breakout box

1-5 Front Channel Section
6-7 MIDI indicator & Phontom power
8 Headphone
9 MIDI I/O
11 8 x ADAT Digital I/O
12-13 S/PDIF & Word Clock
10 M.D.I connector
14 Analog outputs (XLR & 1/4")
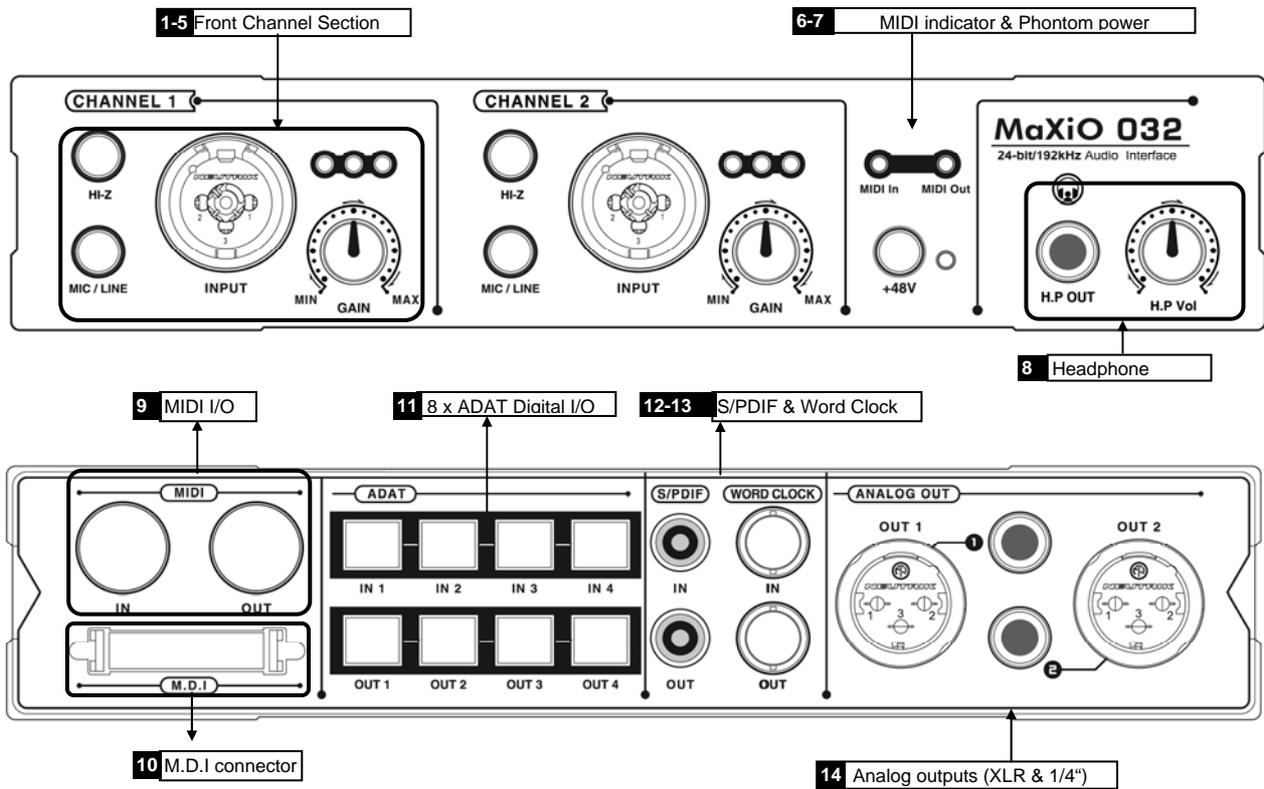
2.4.1 Front Panel Input Channel Section

1 Analog Balanced XLR / TRS (Combo) Input Connector

MaXiO 032 breakout box provides 2 combo connectors (XLR and 1/4" TRS) on the front panel that are used as balanced analog inputs for line level signals and microphone connection (via XLR).
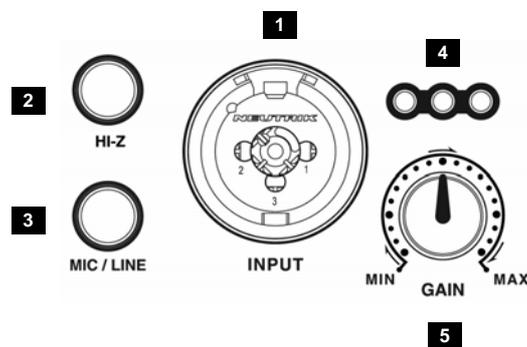
2 **3** Hi-Z and MIC/ LINE Selection Switch

These input channels can be used for line level, microphone signals and Hi-Z. When the MIC/LINE switch is pushed, a microphone can be connected via XLR. When the Hi-Z button is pressed, you can use analog input as electric guitar or bass input. Only unbalanced TRS phone jack connection is available for this setting.

4 Input Gain Control

Controls the amount gain applied to the input signal from the XLR or TRS connector of specific channel. Microphone signals can be amplified with 48dB maximum, line level signals with up to 30dB.

5 Analog Input Level Meter LEDs

The meters indicate the signal level for the analog inputs.

2.4.2 MIDI signal LEDs & Phantom power

6 MIDI signal LEDs.

7 Phantom Power Switch

+48V DC phantom power (for balanced condenser microphones) will be supplied via every XLR input connector when this button is enabled. Note that this affects only those input channels that are set to receive microphone signals (check **2**).

2.4.3 Analog Outputs

8 Headphone output with gain control

You can monitor the playback signal from output 1, 2 through the headphone output. The output level can be adjusted with the volume pot.
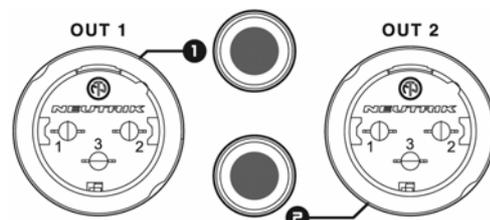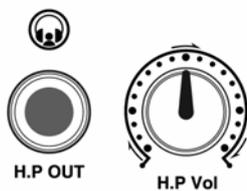
14 Analog 2 XLR and 2 1/4" TRS outputs

2.4.4 Digital I/O

11 MaXiO 032 has 32 channel ADAT optical I/O connectors. You can connect MaXiO 032 to devices such as 4 ADAT compatible devices. One ADAT cable transfers 8 channels with max. 48 kHz.
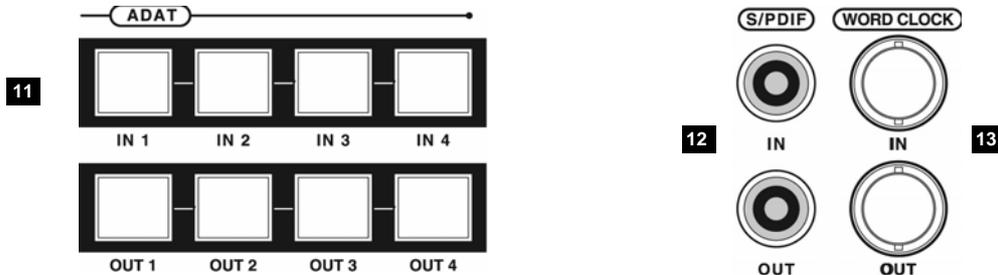
12 Digital S/PDIF (RCA) Input / Output

MaXiO 032 has stereo S/PDIF inputs and outputs (RCA) for coaxial digital connection.

13 Word Clock Input / Output

This connector allows you to synchronise the MaXiO PCI host card via Word Clock (BNC) with other audio devices. You can synchronise other devices via the Word Clock output (FS / 256xFS) and you can also synchronise the MaXiO PCI host card to other devices via the Word Clock input. This is controlled via the MaXiO XD Control Panel software.

2.4.5 MIDI I/O and M.D.I connector

9 MIDI I/O

MaXiO 032 breakout box provides a MIDI interface with 1 input and 1 output (16 channels
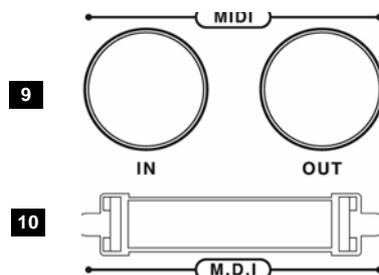
10 M.D.I connector

It's where you can connect MaXiO PCI host card via M.D.I connection cable.

The M.D.I connection can handle 32 digital input and 32 digital output streams for the extension of MaXiO 032 breakout box.

3. Hardware Installation

3.1 Minimum System Requirements

- Intel Pentium 4 or equivalent and compatible CPU
- Motherboard with chipset supporting the Intel Pentium 4 (e.g.: Intel 845, 865 and newer or equivalent VIA Chipset)
- at least 512MB of RAM
- one available PCI slot
- Microsoft Windows 2000/XP operating system
- hard disk supporting UDMA 66/100 and 7200rpm
- active monitor speakers or monitor speakers with powered amplifier

Please check section *5.4.3 I/O Config – CH. Limit* in this manual to find the best setup of your MaXiO system that perfectly matches your specific system configuration.

3.2 Installation of MaXiO PCI host card

The MaXiO PCI host card and other components in your computer can easily be damaged by electrical shocks. You need to use an anti-static device that can discharge the static electricity of your body to avoid potential static damage to the cards.

The MaXiO PCI card is packaged in an anti static plastic pouch. Do not open the pouch until you're ready to install the card.

1. Turn off the computer power and remove the power cable from your computer's power supply.
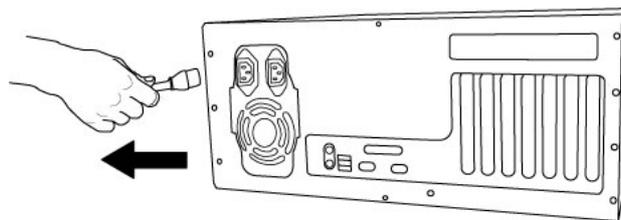
disconnecting the power cord

2. Remove the cover. Make sure that you have an available PCI slot in your motherboard to install the MaXiO PCI host card. Please refer to your computer's user manual on how to remove the cover.
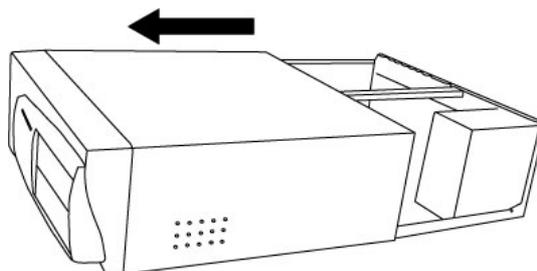
removing the computer cover

To avoid possible static shock to the computer parts, discharge it by touching the computer case or something grounded. We recommend you to use an anti-static device such as an anti-static wrist band. When you need to hold the MaXiO PCI host card, please hold it on the edge of the card. Do not grab the card by touching the board.

3. Find an empty PCI slot on the motherboard.
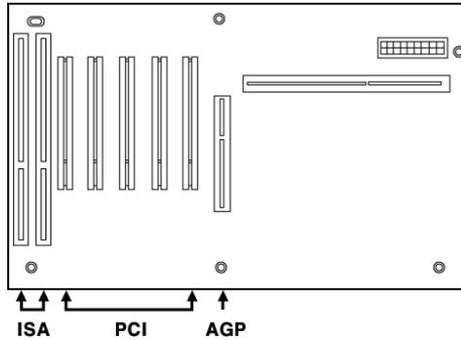
typical PC motherboard slot configuration

If there is a faceplate blocking the empty slot, please remove it using the proper screwdriver.
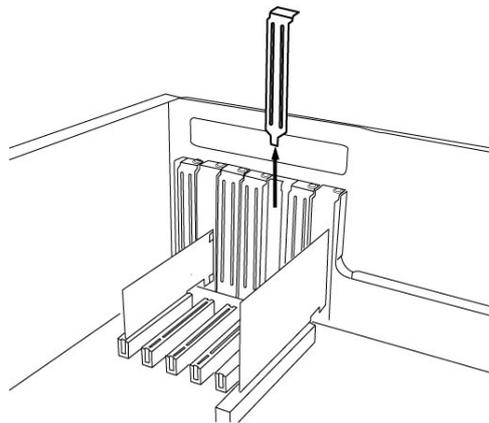
removing the PCI slot faceplate

Put the MaXiO PCI host card into the slot and make sure it is placed in correctly. Insert the card into the slot and then tighten the screw. Then you can close the computer case.
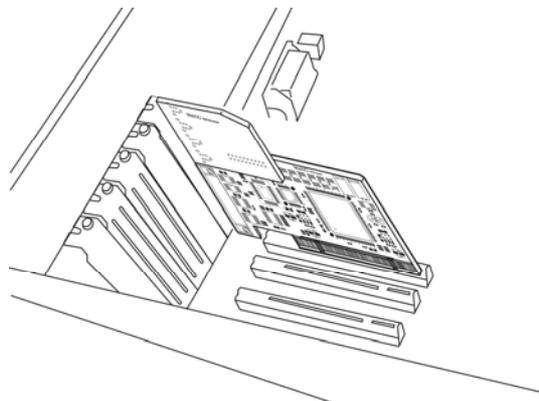
MaXiO PCI host card installed in a PCI slot

4. You can finish the installation of the PCI host card by connecting the M.D.I breakout cable to the M.D.I port (if you use no other M.D.I compatible device like the MaXiO 032 breakout box).

3.3 EX8000 connection

After the MaXiO PCI host card is installed in the PCI slot, you should connect EX8000 to the card using the supplied standard IEEE1394/FireWire cable.

Start by connecting the EX8000 with the E.D.I In connector on EX8000 with the first E.D.I port on the MaXiO PCI host card as shown on the picture below. If you have several EX8000 units, connect the second unit to the second E.D.I port and so on.
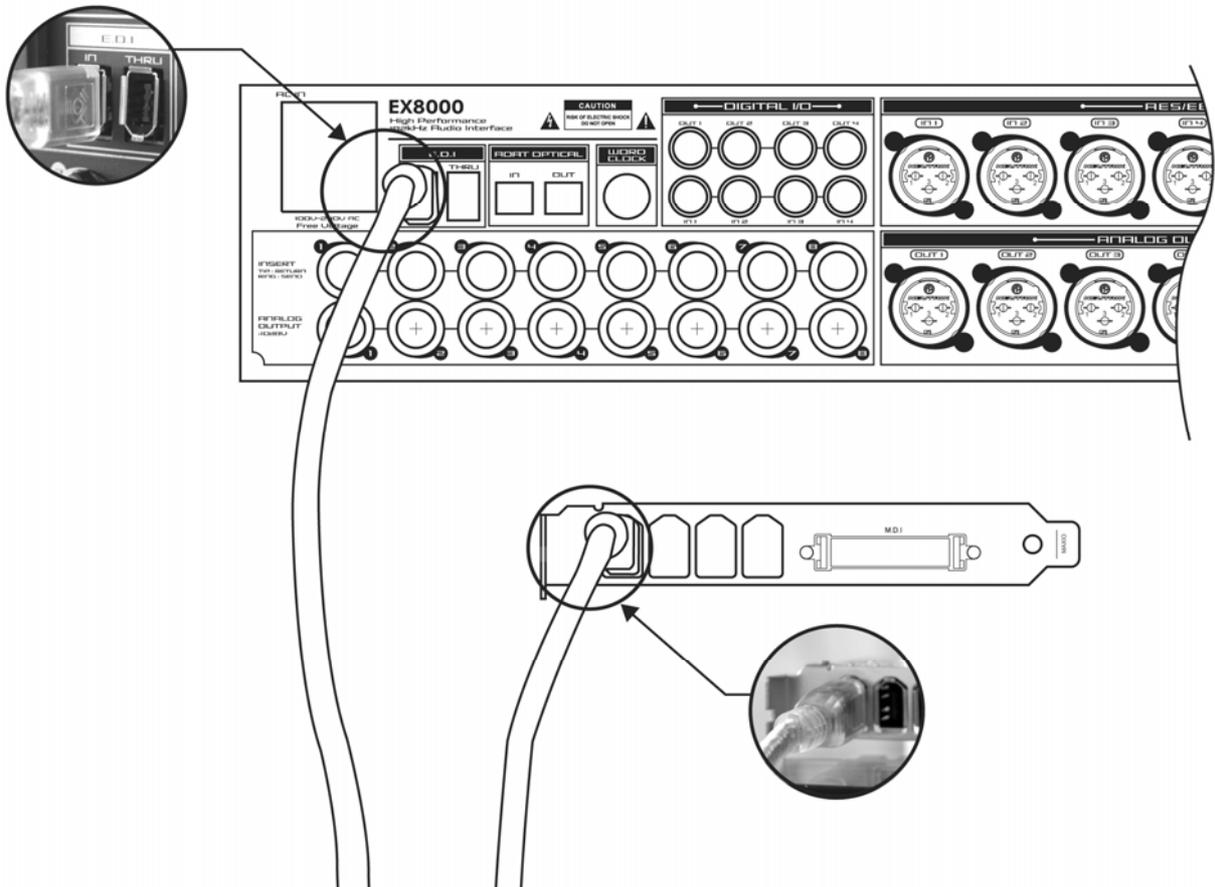
3.4 MaXiO 032 connection

After the MaXiO PCI host card is installed in the PCI slot, you should connect MaXiO 032 to the card using the supplied M.D.I cable.

Start by connecting the MaXiO breakout box with the M.D.I In connector on MaXiO breakout box with the M.D.I port on the MaXiO PCI host card as shown on the picture below. If you have EX8000 units too, connect it to the E.D.I port and so on.
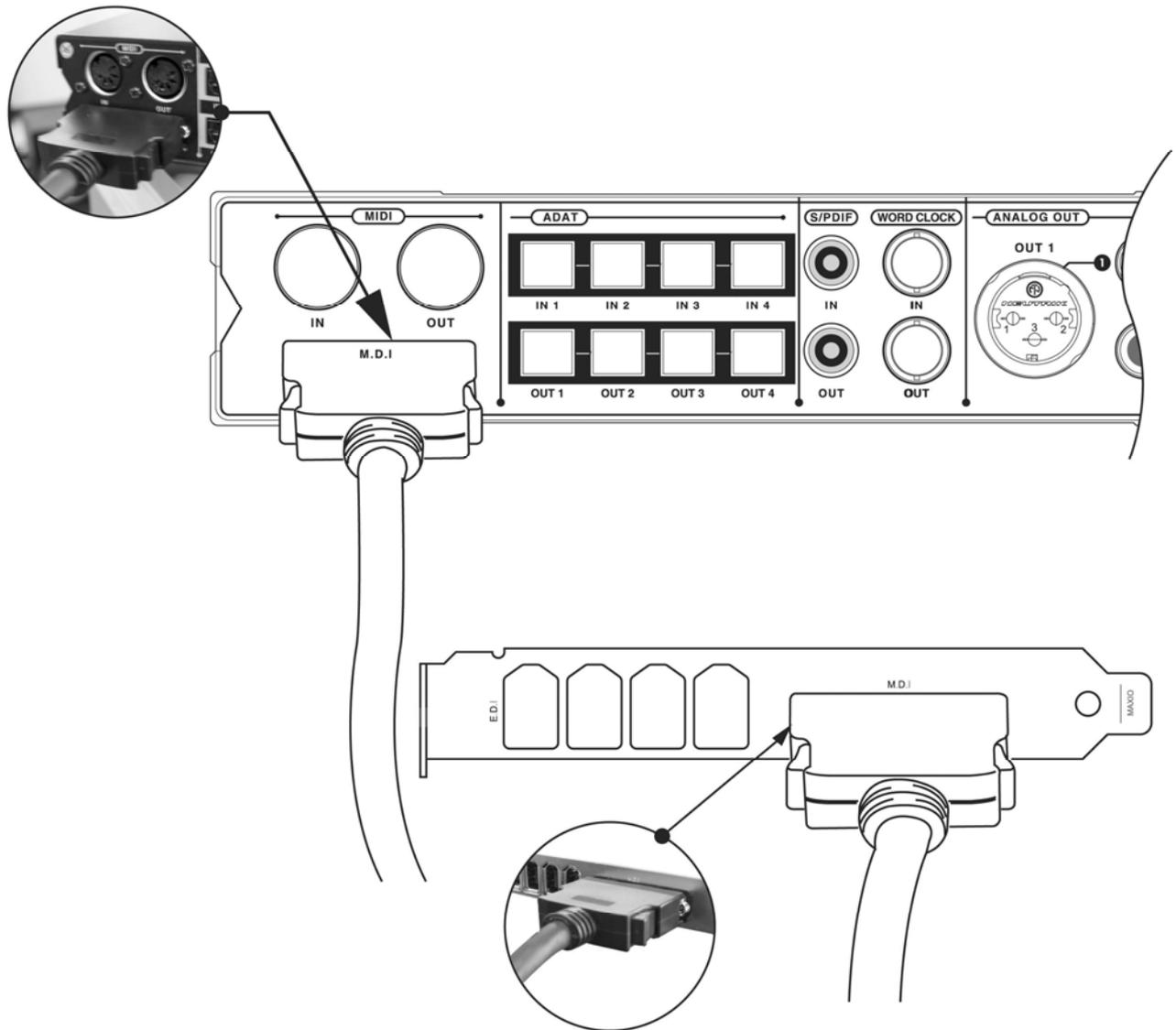
4. Driver Installation

After completing the hardware installation of your MaXiO, you need to install its driver. The installation steps in Windows 2000 and Windows XP vary, but they are similar between the different versions of Windows. The installation steps shown below are based on Windows XP installation.

> ⚠️
> **CAUTION**
>
> Depending on your system, you may need your Windows installation CD.
>
> Because of the driver characteristic, the MaXiO driver installs several devices. In some cases Windows continuously tries to reboot your system. Unless the driver installation is completely finished, e.g. the system does not detect any new devices, DO NOT reboot the system. Restart your computer only after the drivers for all devices are installed.

Follow the following steps for the installation:

1. Turn on the main power of your computer. Windows will automatically detect that a new device has been installed and prompt you with the *Found New Hardware Wizard* screen.

    Choose *Install from a list or specific location* and click *Next >*.

2. Choose *Search for the best driver in these locations* and specify the location of the driver. Insert the provided driver CD into the CD-ROM drive and select *Include this location in the search* and click *Browse* to find the accurate location of the driver. Then confirm your selection with *Next >*.
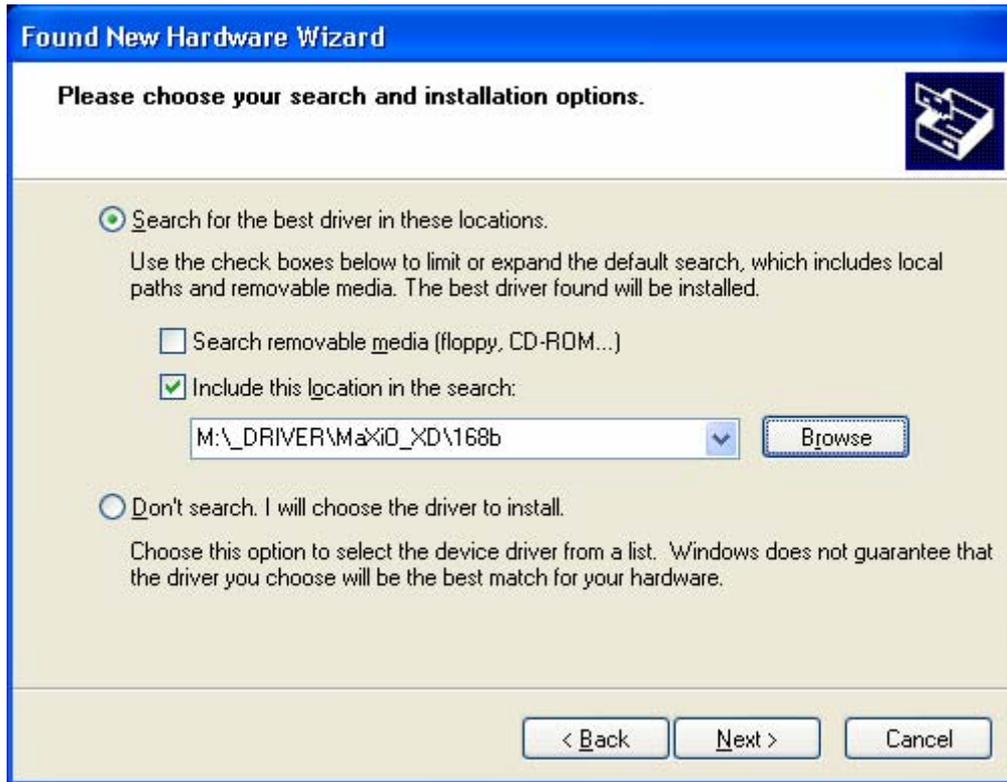
3. During installation, you will be prompted with a message warning that the driver software has not passed Windows Logo testing. Select *Continue Anyway* and proceed with the installation. The driver is completely tested and verified by ESI, and safe to use.

4. The *MaXiO EWDM Controller* driver will be installed.

5. Keep going to install follow the instructions on screen. Other devices (such as *MaXiO EWDM Wave-1*) are installed now after each other. Check the screen shots for reference.
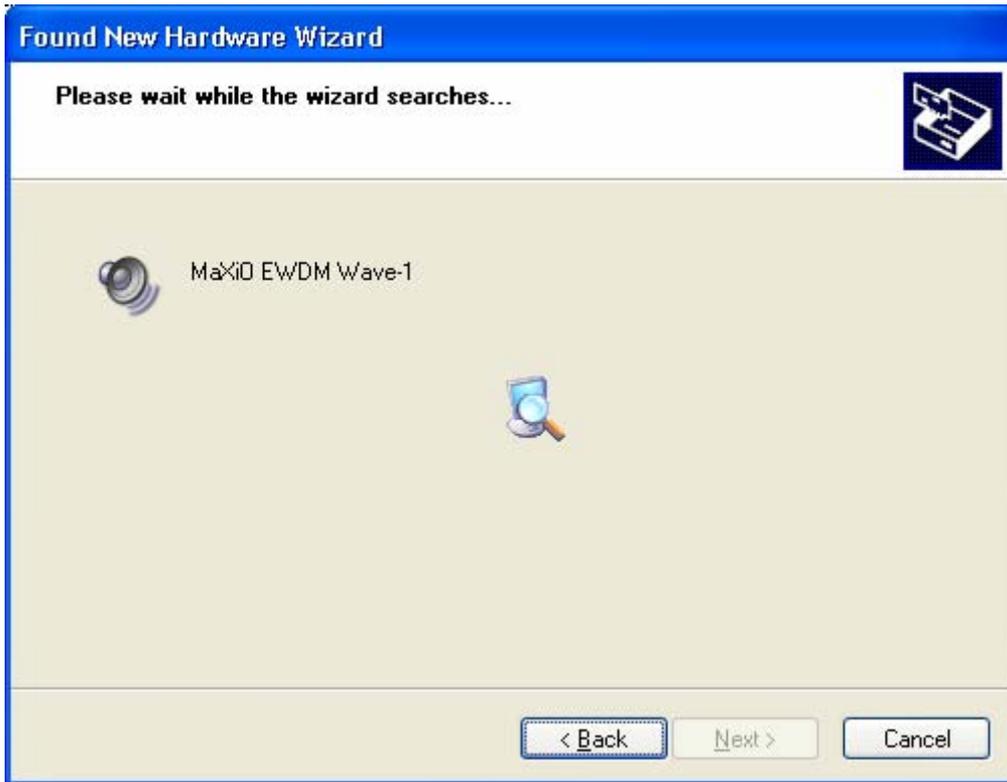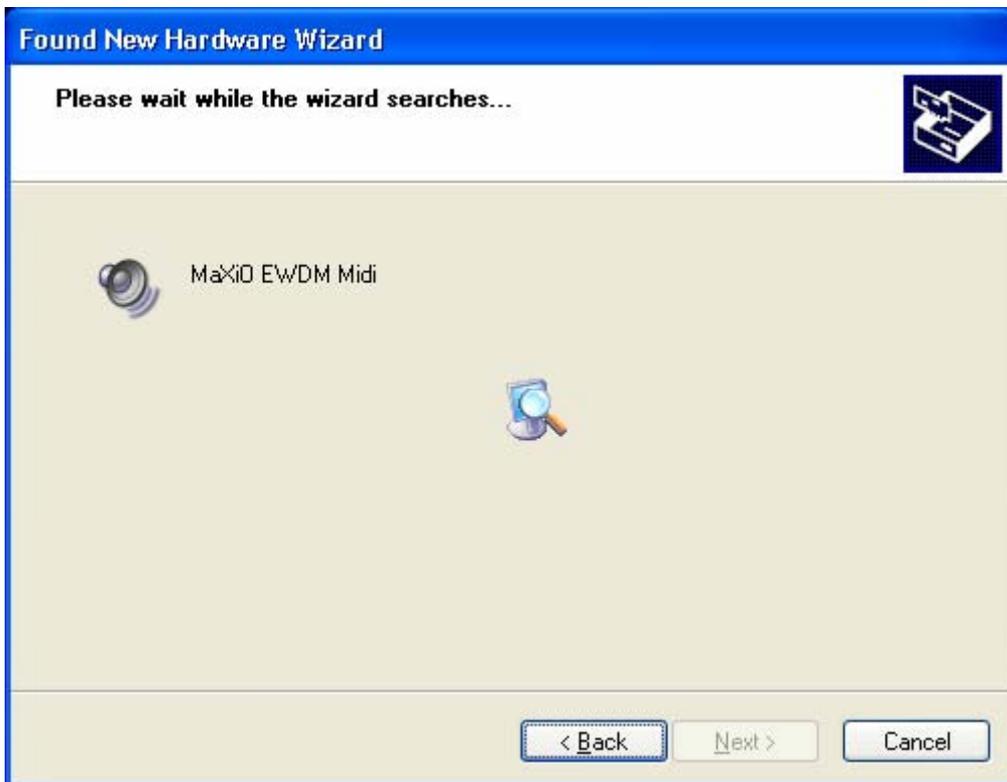
When the system asks you to restart the computer (which happens on some computers), just **ignore** the requests and continue to install. When all the necessary device drivers are installed and the system is not asking you to install any further drivers, **restart the computer manually**.

6. Now you can check if the installation was successful.

After you restart Windows, please confirm if the [icon] icon is visible in the system tray of the task bar.

Then go to *My computer -> Control panel -> System -> Device Manager*. Check the devices under *Sound, video and game controllers*, if they are installed correctly.
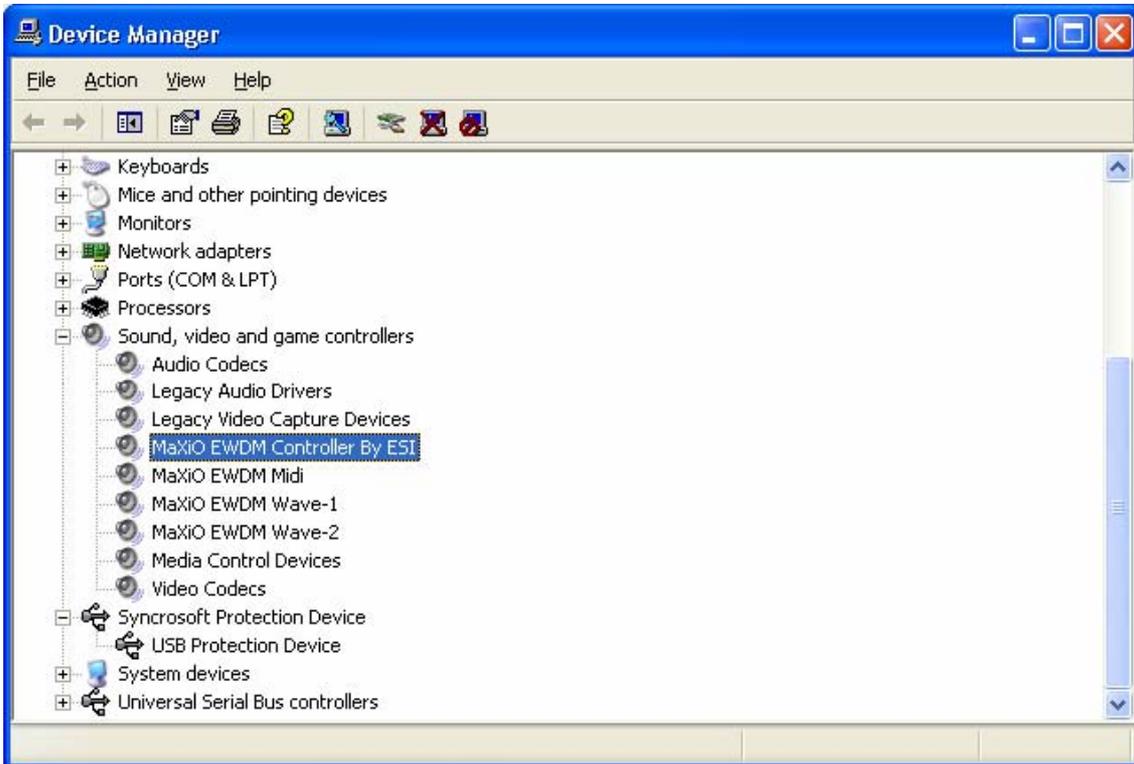
5. MaXiO Control Panel

After you completed the hardware and driver installation for your MaXiO XD system, you need to learn about the MaXiO Control Panel. This control panel allows you to control your setup for MaXiO XD.

After successfully installing the MaXiO XD hardware and driver, you can see the [ESI] icon on the system tray of the task bar. Clicking on this icon will launch the MaXiO Control Panel.
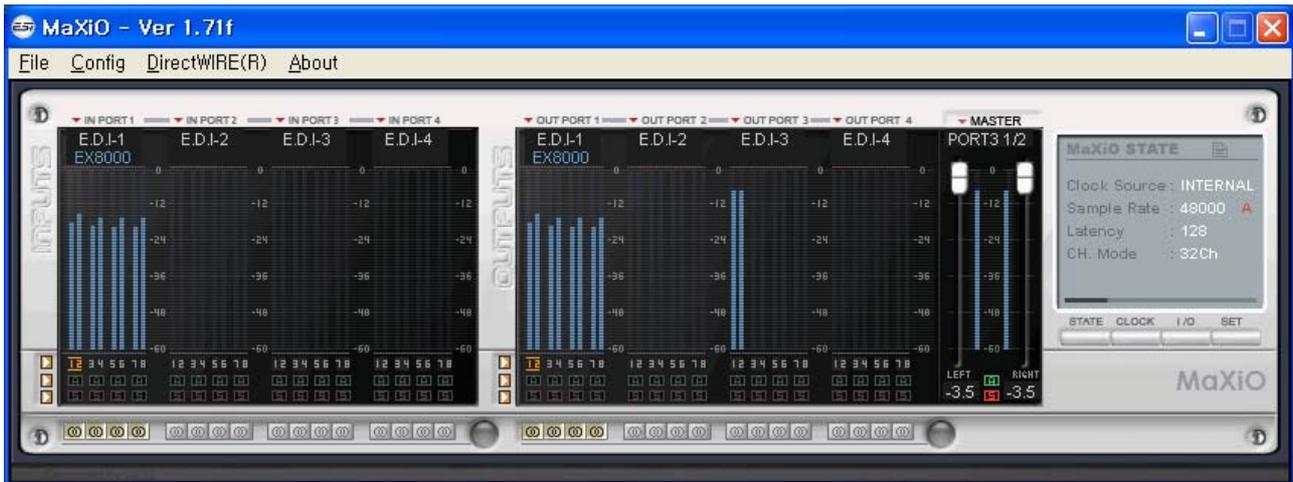
5.1 Pull Down Menu

The MaXiO Control Panel includes a pull down menu section that contains the configuration menus for the MaXiO XD system.
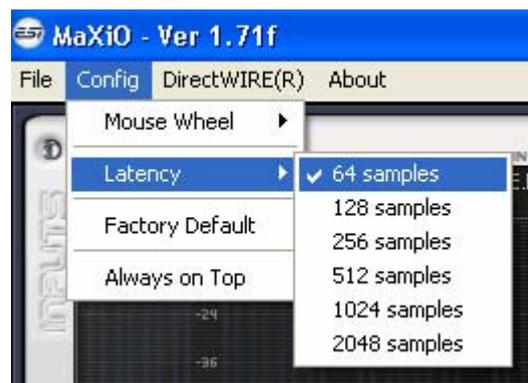
File - Exit

This will close the MaXiO Control Panel window but it will not shut down the control panel. You can always relaunch the control panel by clicking 'ESI' icon on the system tray.

Config – Mouse Wheel

Controls the increment at which the volume is adjusted when using a mouse wheel. The adjustment step is from 1 to 8.

Config – Latency

Here you can choose between different buffer sizes. There are 2 different sections: First buffer sizes from 128 samples (3 milliseconds with 44.1 kHz) to 2048 samples (48 milliseconds with 44.1 kHz). Secondly there are the ultra latency settings: buffer sizes from 96 Samples (2,5 milliseconds) to 32 Samples (0.75 milliseconds). A lower latency is achieved by selecting a smaller buffer size.

Typically a lower latency is good when working with software synthesizers or when you process audio signals from the audio inputs in realtime with your audio software. A smaller latency value will however also cause more system load.

For most recording applications on a typical PC, select buffer sizes between 64 and 512. For a typical faster Pentium 4 system, 128 or 256 are good values. Buffer sizes of 32, 48, 1024 and 2048 are normally used only in special circumstances, e.g. 32 is reserved for very fast and reliable ASIO driver working environments only. The factory default is 512 to provide a basic level of compatibility to different systems.

Config – Factory Default

Returns all MaXiO Control Panel configuration settings to the factory default.

Config - Always On Top

Enables to display the MaXiO Control Panel always over other windows. If this is not selected, the active windows of other applications will be shown over the MaXiO Control Panel.

5.2 Input Section
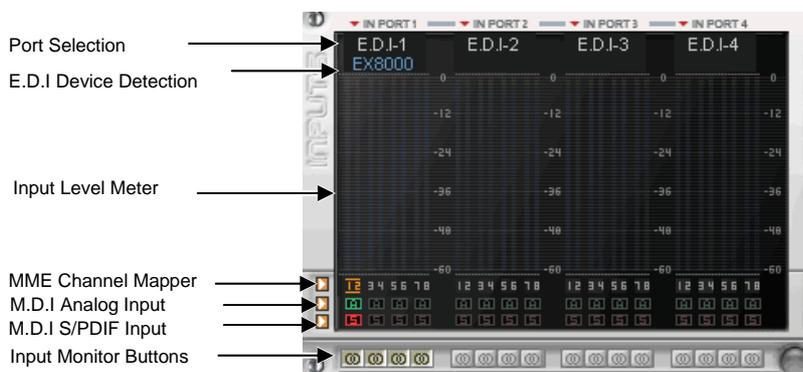
The left section of the control panel windows shows the status and the control features for the input channels. The main part of the display is the Input Level Meter for each channel. Above that the Control Panel displays automatically if an external device such as the EX8000 is connected to one of the E.D.I ports. Below the level meter, controls for each specific channel are provided (MME device selection for recording, M.D.I input channel selection). A detailed explanation for each section starting from top follows. Note that the input monitoring section is explained under 5.3.1 Master Section.

Port Selection

The 32 input channels of the MaXiO XD system are grouped into 4 sections (ports) with 8 input channels each. For each group of 8 channels (each port), you can select either the corresponding E.D.I input (1 to 4) or the signals from the M.D.I connector by clicking on the *IN PORTx* label. When you change the selection of a port, the same change will be made for the output channels.

When a port is set to M.D.I, the corresponding input channels from a device connected to the M.D.I port like the MaXiO 032 breakout box are use. The specific E.D.I port cannot be used at the same time. For example, if you select M.D.I for port 2 (channels 9-16), you can use input channels 9-16 from device like the MaXiO 032 connected to the M.D.I port of the MaXiO PCI host card but you cannot use the E.D.I port 2 (e.g. if an EX8000 is connected to it).

E.D.I Device Detection

The MaXiO Control Panel will automatically detect any device connected to a E.D.I port. For example, if EX8000 is connected to E.D.I port 1, you can control its features by double clicking on the blue *EX8000* text. A separate window will be opened.

MME Channel Mapper

The MaXiO XD system driver provides the MME device *MaXiO Stereo Wave (SPDIF/PCM)* that can be used for recording and playback of stereo signals. The MME Channel Mapper section in the MaXiO Control Panel allows you to assign the I/O channels that will be used by this MME device.

You have two options to select the I/O channel for the MME device. You can click on the arrow button (⬛) and then select the channel in the menu that will appear or you can click on the individual icon (⬛) under each channel.

The MME Channel Mapper has no influence on the multichannel MME device *MaXiO Multi Wave* or on the ASIO driver *ASIO 2.0 -MaXiO*.

M.D.I Analog and S/PDIF Input

The MaXiO PCI host card provides support for two analog input channels and a digital S/PDIF input made available via a device connected to the M.D.I port of the card. For example, the MaXiO 032 breakout box provides both analog input channels and a digital S/PDIF input. The M.D.I breakout cable that is supplied with the basic MaXiO XD system provides a digital S/PDIF input but no analog input channels.

The two analog input channels and the two input channels from the digital S/PDIF input can be assigned to any channel pair of the 32 input channels provided by the MaXiO PCI host card. The ⬛ button assigns the two analog input channels to the specific channel pair, the ⬛ button assigns the two S/PDIF input channels instead. Alternatively you can assign the channels via the arrow buttons (⬛) on the left side and the menu that will appear when you click on it.

Please note that when you select the analog or S/PDIF input channels, the input signals from that specific channel pair from the E.D.I or M.D.I multichannel ports are no longer used.

Please keep in mind that the M.D.I analog and S/PDIF input selection buttons should not be used if you do not want to use the S/PDIF or analog input signals from the device or cable connected to the M.D.I port – use them only when you are using the M.D.I breakout cable (S/PDIF inputs, no analog inputs) or a M.D.I extension like the MaXiO 032 breakout box (both S/PDIF and analog inputs).

5.2.1 Input signal path block diagram
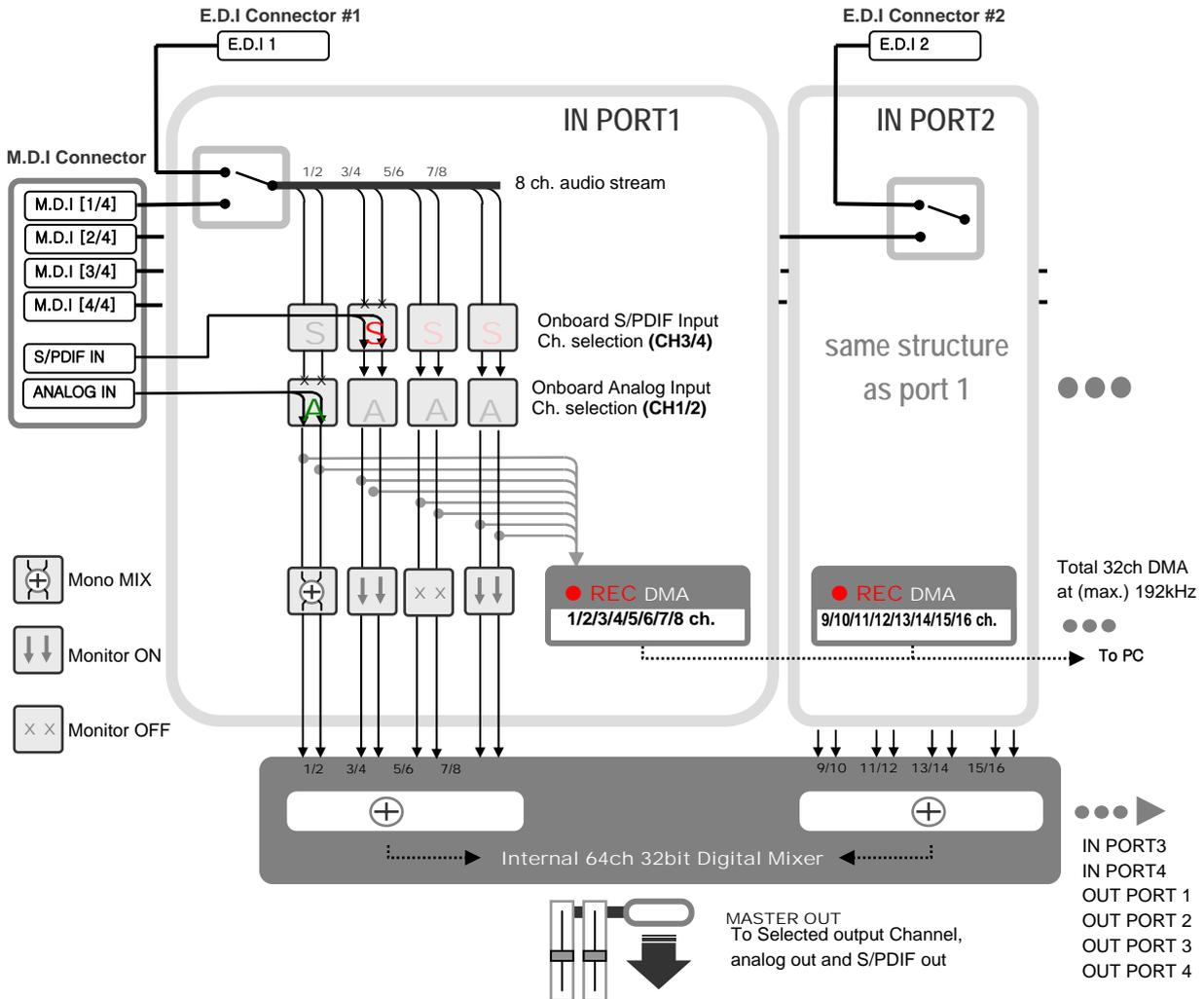
5.3 Output Section

The right section of the control panel windows shows the status and the control features for the output channels. The layout is very similar to the input section (described in the previous section). The main part of the display is the Output Level Meter for each channel. Above that the Control Panel displays automatically if an external device such as the EX8000 is connected to one of the E.D.I ports. Below the level meter, controls for each specific channel are provided (MME device selection for playback, M.D.I output channel selection). A detailed explanation for each section starting from top follows.

Port Selection

The 32 output channels of the MaXiO XD system are grouped into 4 sections (ports) with 8 output channels each. For each group of 8 channels (each port), you can select either the corresponding E.D.I output (1 to 4) or the channels of the M.D.I port by clicking on the *OUT PORTx* label. When you change the selection of a port, the same change will be made for the input channels.

E.D.I Device Detection

The MaXiO Control Panel will automatically detect any device connected to a E.D.I port. For example, if EX8000 is connected to E.D.I port 1, you can control its features by double clicking on the blue *EX8000* text. A separate window will be opened.

MME Channel Mapper

The MaXiO XD system driver provides the MME device *MaXiO Stereo Wave (SPDIF/PCM)* that can be used for recording and playback of stereo signals. The MME Channel Mapper section in the MaXiO Control Panel allows you to assign the I/O channels that will be used by this MME device.

You have two options to select the I/O channel for the MME device. You can click on the arrow button (□) and then select the channel in the menu that will appear or you can click on the individual icon (■) under each channel.

The MME Channel Mapper has no influence on the multichannel MME device *MaXiO Multi Wave* or on the ASIO driver *ASIO 2.0 -MaXiO*.

M.D.I Analog and S/PDIF Output

The MaXiO PCI host card provides support for two analog output channels and a digital S/PDIF output made available via a device connected to the M.D.I port of the card. For example, the

MaXiO 032 breakout box provides two analog output channels and a digital S/PDIF output. The M.D.I breakout cable that is supplied with the basic MaXiO XD system provides a digital S/PDIF output but no analog output channels.

One channel pair each can be assigned to these analog outputs and to that S/PDIF output. The 🔳 button assigns the specific channel pair to the analog output channels, the 🔳 button assigns the the channel pair to the S/PDIF output. Alternatively you can assign the channels via the arrow buttons (🔳) on the left side and the menu that will appear when you click on it.

Please keep in mind that you can use these outputs only when you are using the M.D.I breakout cable (S/PDIF output, no analog outputs) or a M.D.I extension like the MaXiO 032 breakout box (both S/PDIF and analog outputs).

5.3.1 Master Section

The Master Fader allows you to change the level of one final stereo mixed output signal. The level can be set using the mouse, mouse wheel, or cursor keys.

You can select the output channel for the master signal by clicking on the red arrow left of the *MASTER* label. Under it, the current selection will be displayed. The picture below shows channel 1/2 of Port 3 as selection. This output receives a mix of the 8 input channels from Port 1 and the 8 playback channels from Port 2 (check the description of the monitoring buttons in the next section for reference). On this picture, the Control Panel is also configured to send out the master signal to the S/PDIF and Analog outputs of the device / cable connected to the M.D.I port.
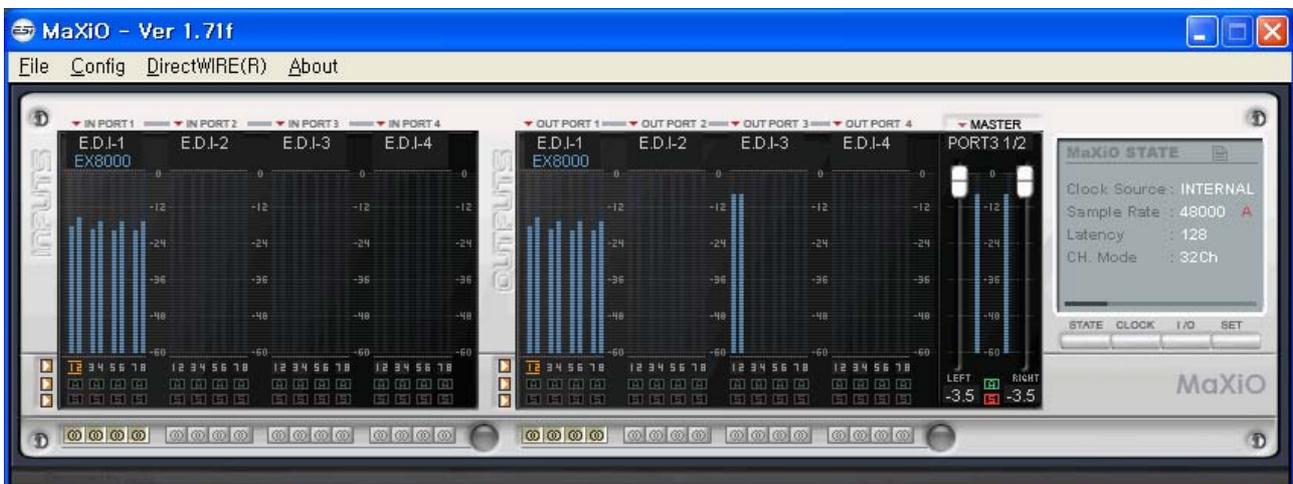
In many typical setups you would use output 1/2 of the first port (e.g. the first EX8000) as master output. Via the monitoring buttons (see below) you can then mix all signals to this stereo output.

Monitoring Buttons

With the monitoring buttons under each channel (input and playback), you can enable monitoring of the specific channel pair via the master output channel.

🔳 : Monitoring disabled

🔳 : Monitoring enabled

[icon] : Monitoring enabled, signal will be mixed to mono

With the circle on the right, you can disable/enable monitoring for all input (or playback) channels simultaneously.

5.3.2 Master & Output signal path block diagram
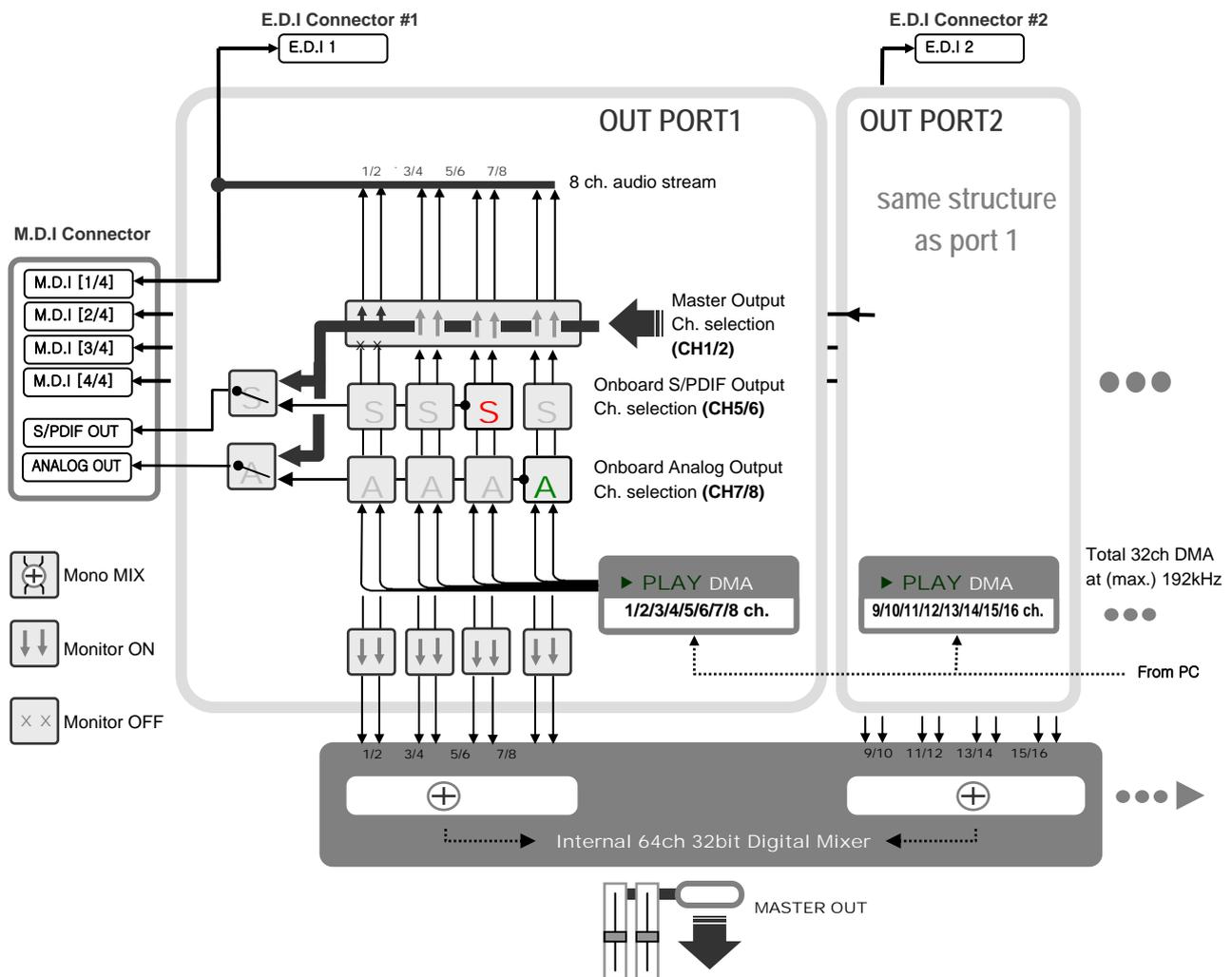
5.4 MaXiO display section

The MaXiO display section on the right of the MaXiO Control Panel window is the location where you can check and control the current status of the MaXiO PCI host card. It is divided into different sections that you can call by clicking on the specific button.

5.4.1 MaXiO State
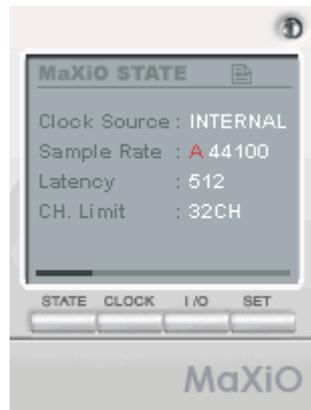
This panel shows you the -currently active- most important settings of the MaXiO PCI host card.

5.4.2 System Clock
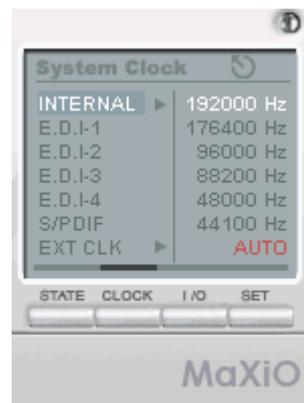
Internal: selects the internal clock generator on the MaXiO PCI host card to provide the system clock for the complete MaXiO XD system. You need to use this setting when MaXiO is used alone or if all other digital devices connected to the MaXiO XD system are configured as clock slave. Select *AUTO* if you want the sample rate selected automatically (e.g. it will be controlled by the audio applications using the MaXiO driver to playback or record audio). The red color shows that *AUTO* is on. If the automatic mode is not selected (no red color), you can select the sample rate manually. Please always set your MaXiO PCI host card to internal clock before you start to change the clock settings of other digital devices.

E.D.I-x: Selects the clock provided by the unit connected to the specific E.D.I port (e.g. an EX8000). This mode can only be selected when the external device (e.g. EX8000) has been configured to internal clock first (before you change this setting).

S/PDIF: Selects the S/PDIF input of the MaXiO PCI host card (via the M.D.I connection, e.g. the M.D.I breakout cable) as master clock. This mode can only be selected when the device connected to the S/PDIF input is configured as clock master.

EXT CLK: Selects the Word Clock input of the MaXiO PCI host card (via the M.D.I connection, e.g. the M.D.I breakout cable) as master clock. This mode can only be selected when the device connected to the Word Clock input is configured as clock master. You can choose between *FS* (Word Clock) or *256FS* (Super Clock) settings.

5.4.3 I/O Config

Analog: This where you adjust the analog output level of the analog output channel of the MaXiO PCI host card. This analog output is only available when you have connected a device to the M.D.I port with analog outputs (such as the MaXiO 032 breakout box).

S/PDIF: this can be *Pro*, which means that actually an AES/EBU signal with the 'professional' status bit set is transferred via the S/PDIF I/O of the MaXiO PCI host card (via the M.D.I connection, e.g. the M.D.I breakout cable), or it can be *Consumer*, which means that normal S/PDIF signals are transferred.

Word: this setting allows you to define if you want to send out a standard Word Clock (*FS*) or a Super Clock (*256FS*) signal via the Word Clock output of the M.D.I connection, e.g. the M.D.I breakout cable.

CH. Limit: The *CH. Limit* setting allows you to limit the maximum number of channels that are transferred via the PCI bus. If you select *32Ch*, all 32 input and 32 output channels are active at the same time. If you select *16Ch*, only the first 16 input and the first 16 output channels are active, if you select *8Ch*, the first 8 input and the first 8 output channels are active. The lower the setting will be, the lower the PCI transfer generated by the MaXiO PCI host card will be.

· depending on the system performance of the mainboard (and chipset) you use, you need to lower this setting from *32Ch* to *16Ch* or *8Ch*. Only fast and modern mainboards (check the system requirements) allow you to use the *32Ch* mode.

· the performance you can achieve with your MaXiO PCI host card based system also depends on other components in your system beside the mainboard (and chipset). For example, other PCI devices in your system (like high end network adapters, SCSI controllers, SATA/RAID controllers, etc.) may affect the performance, especially when you use the *32Ch* mode and higher sample rates.

· as a general rule, it is better to use the *8Ch* mode if you do not use more than 8 input and 8 output channels or the *16Ch* mode if you do not use more than 16 input and 16 output channels.

· as a second general rule, the sample rate you use also affects the system performance, e.g. using 192kHz requires a faster system than using 48kHz. Another example: using 192kHz at the *8Ch* setting affects the system in the same way as using 48kHz at the *32Ch* setting or using 96kHz at the *16Ch* setting.

The default setting is *8Ch*. If you connect multiple external units such as EX8000 or a single MaXiO 032 breakout box to one MaXiO PCI host card, you need to change the *CH. Limit* setting before you can use more than 8 input and 8 output channels.

· please always check our website (www.esi-pro.com) for updated information about system performance and system compatibility. If you are in doubt if your system works properly with a MaXiO XD system, contact our technical support.

5.5 The EX8000 control panel

Each EX8000 connected to the MaXiO PCI host card has its own control panel windows that you can access by double clicking on its name in the MaXiO Control Panel.
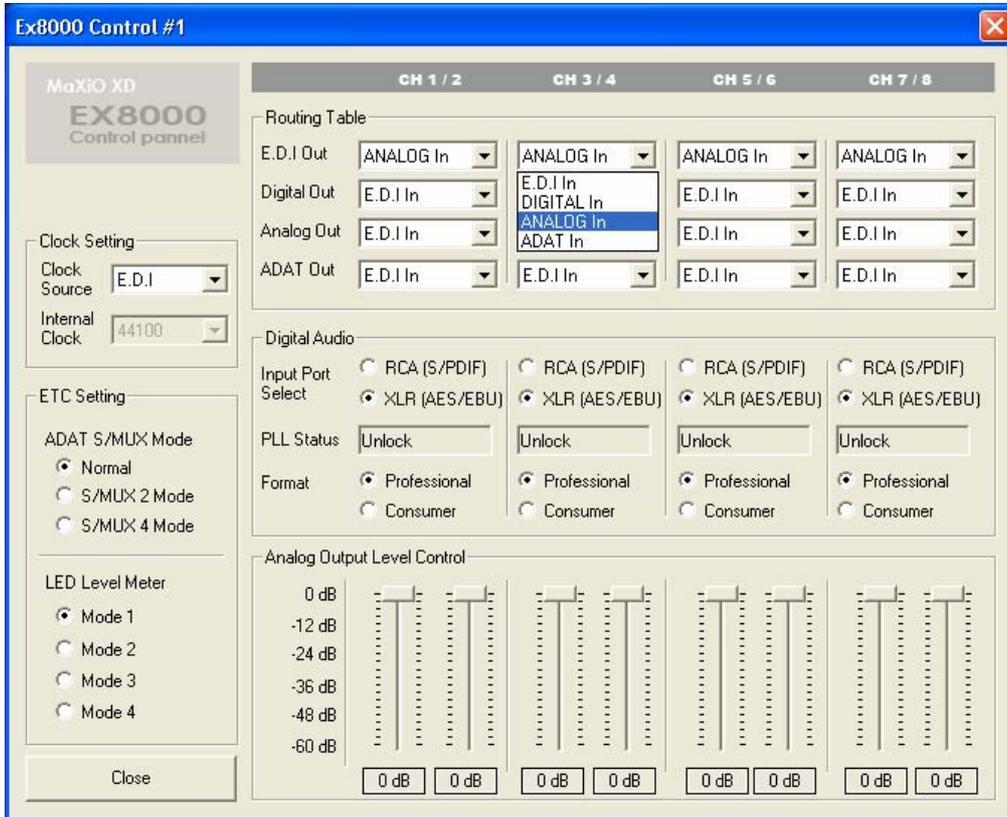
Clock Setting: Defines the system clock of the specific EX8000 unit.
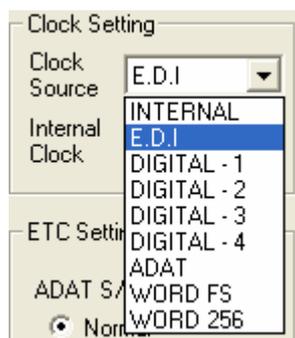
    Internal: Use the internal clock inside EX8000.
    EDI: Use the clock from the MaXiO PCI host card (recommended default).
    DIGITAL 1~4: Use the clock from the digital inputs of EX8000.

ETC Setting

    ADAT S/MUX Mode: - Normal (44 kHz ,48 kHz – 8 channels)
                                   - SMUX 1 (96 kHz – 4 channels)
                                     - SMUX 2 (192 kHz – 2 channels)

    LED Display: - Mode 1 (shows a continuous graphical representation of the level)
                           - Mode 2 (continuous display with level meter peak hold)
                           - Mode 3 (shows a dot representation of the level)
                           - Mode 4 (the level meter will hold the maximum level that was reached)

Routing Table:

This is where you can route input ports and output ports of EX8000. The 4 pair of stereo channels look alike and function identically. EX8000 has 4 different types of I/O ports – E.D.I, Digital (AES/EBU and S/PDIF), Analog and ADAT. You can select an input port for each output port.

Example: If you want to send the signal that comes from analog input to E.D.I output (to the MaXiO PCI host card), you would set the control panel like shown on the following picture.
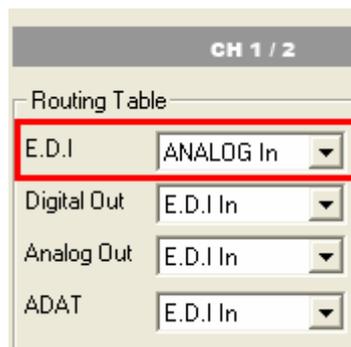
Please have a look at the following audio routing table that shows you all the audio routing options of EX8000 when connected to the MaXiO PCI host card.
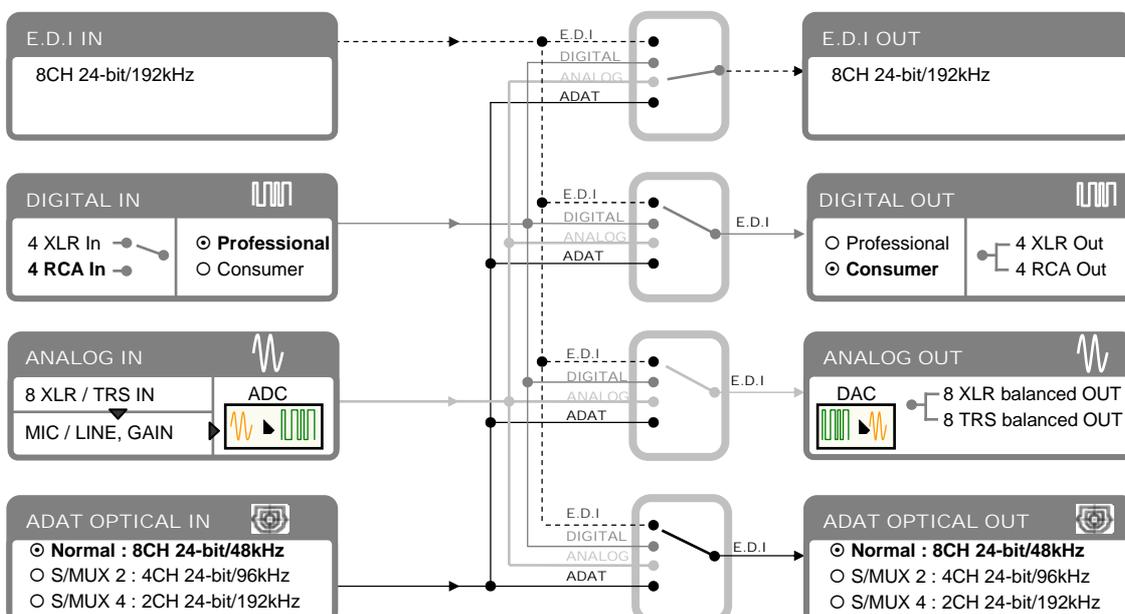
Digital Audio

> **Input Port Select**:   This is where you can switch between the coaxial S/PDIF digital input and the XLR AES/EBU digital input for each of the 4 digital inputs available in each format.

> **PLL status**: Shows if an S/PDIF (or AES/EBU) connection is made. If *Lock* is displayed, an S/PDIF (or AES/EBU) signal is detected at the specific input. If *Unlock* is displayed, no signal is detected.

> **Format**: - Professional (IEC 958 Type 1): EX8000 digital in/out format is AES/EBU.
>   - Consumer (IEC 958 Type II): EX8000 digital in/out format is S/PDIF.

> Note that you can set this to *Professional* but keep the RCA (S/PDIF) port. This would allow you to process an AES/EBU signal coming in on an unbalanced S/PDIF cable.
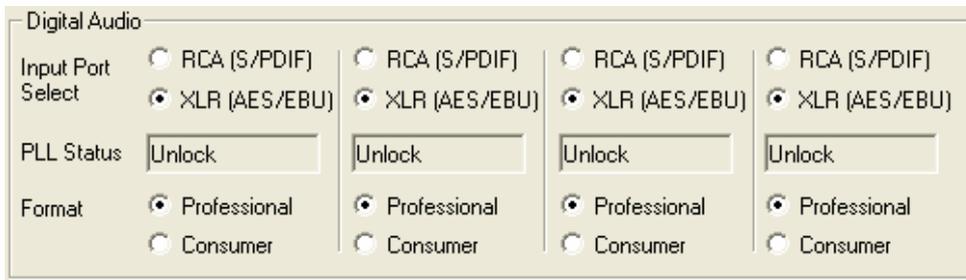
> **Analog Output Level Control**:   This is where you can control the analog output level for each playback / output channel.
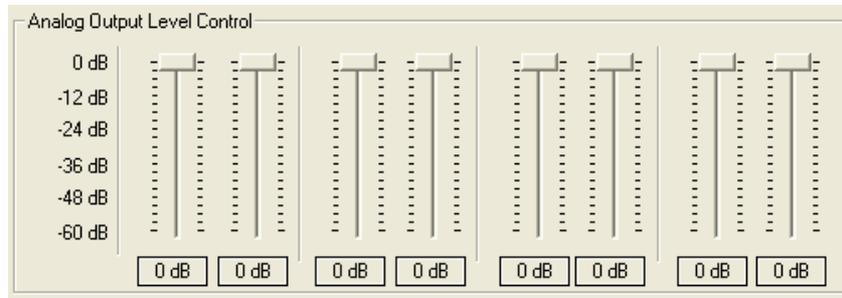
6. Applications Setup

This chapter contains basic configuration examples for some popular software applications. Please also refer to the manual of the audio software you use for detailed information.

6.1 Windows Multimedia setup

The Windows Multimedia setup is required if you want to use your MaXiO system as the main sound device for Windows multimedia applications.

Go to *My computer-> Control panel -> Sounds and Audio Device Properties -> Audio*. Select the MaXiO driver as your playback device. You can choose *MaXiO Multi Wave* (as multichannel device for consumer audio applications supporting multichannel playback like DVD player applications) or *MaXiO Stereo Wave(SPDIF/PCM)* (as classical stereo playback device).
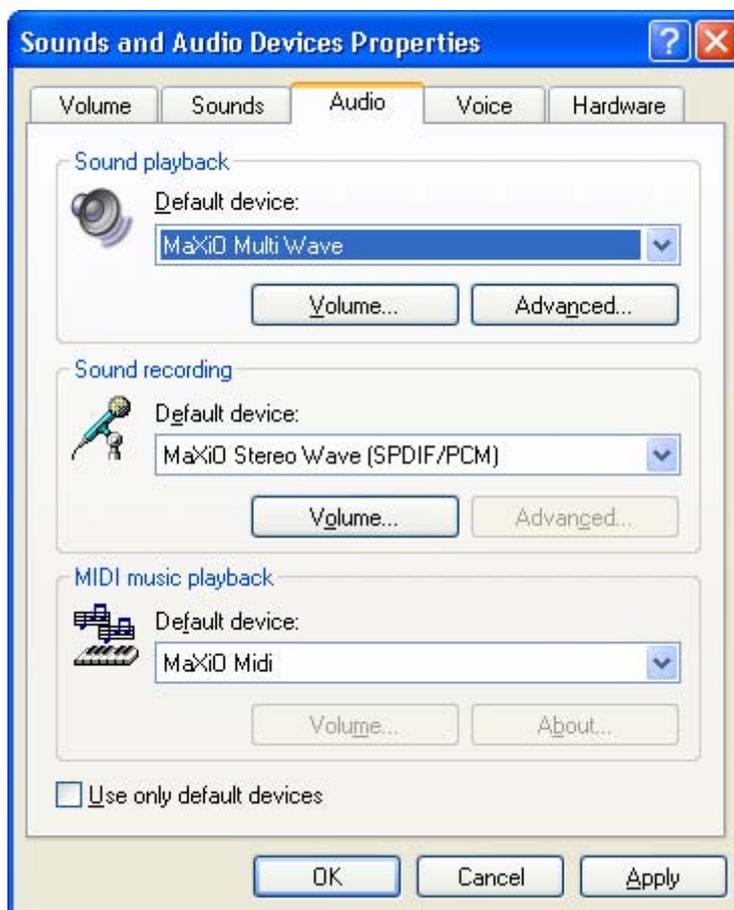
6.2 Cubase and Nuendo

After launching Cubase or Nuendo, go to *Device -> Device Setup -> VST Multitrack*. Select *ASIO 2.0 –MaXiO* as ASIO device. Then go to *Default MIDI Ports* and select *MaXiO MIDI*. Note: clicking the *ASIO Control Panel* button will not do anything here. Make sure you click the *Apply* button after changing the settings.
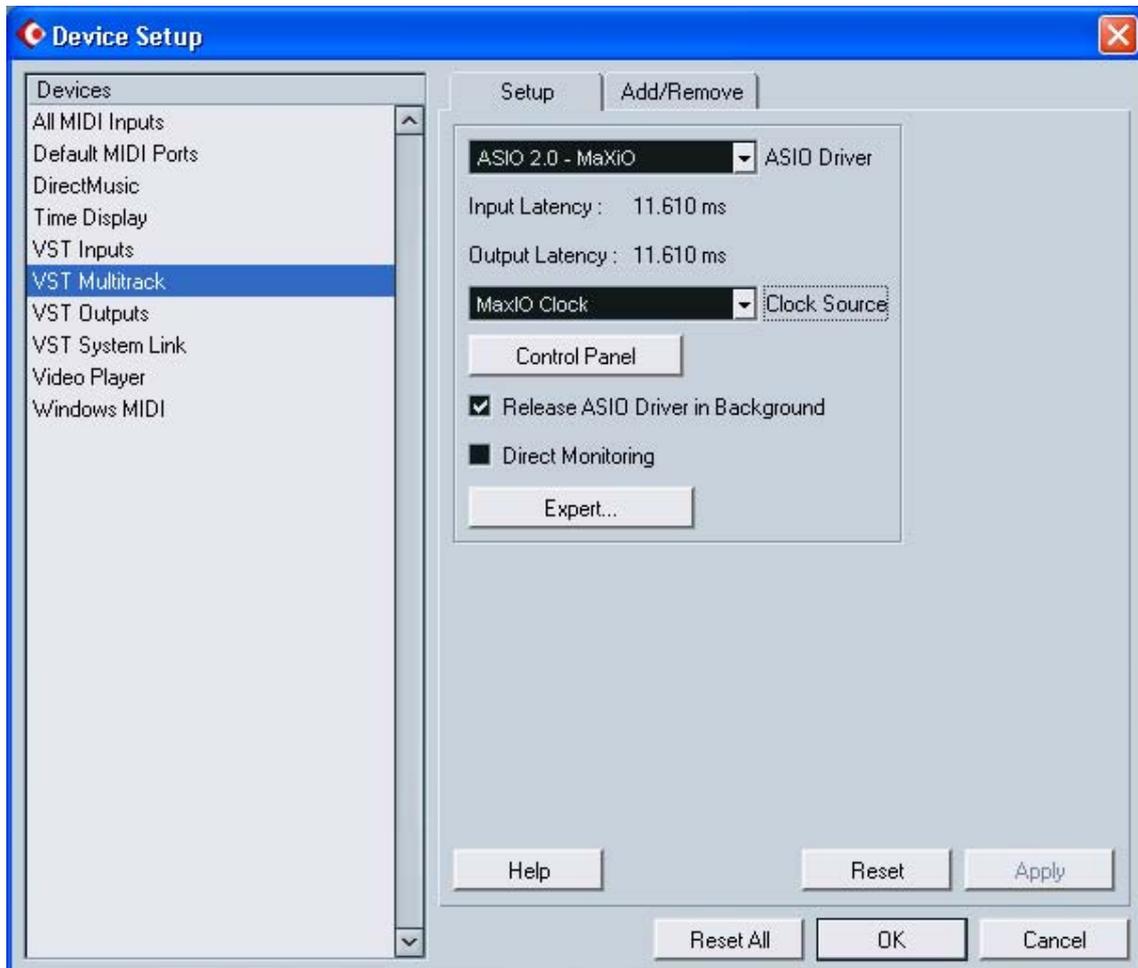
6.3 Cakewalk SONAR

There are few steps to configure SONAR, which supports either WDM or ASIO drivers. After launching SONAR, go to *Options > Audio*.

If you prefer the **WDM/KS mode, change the settings as** shown in the following picture:
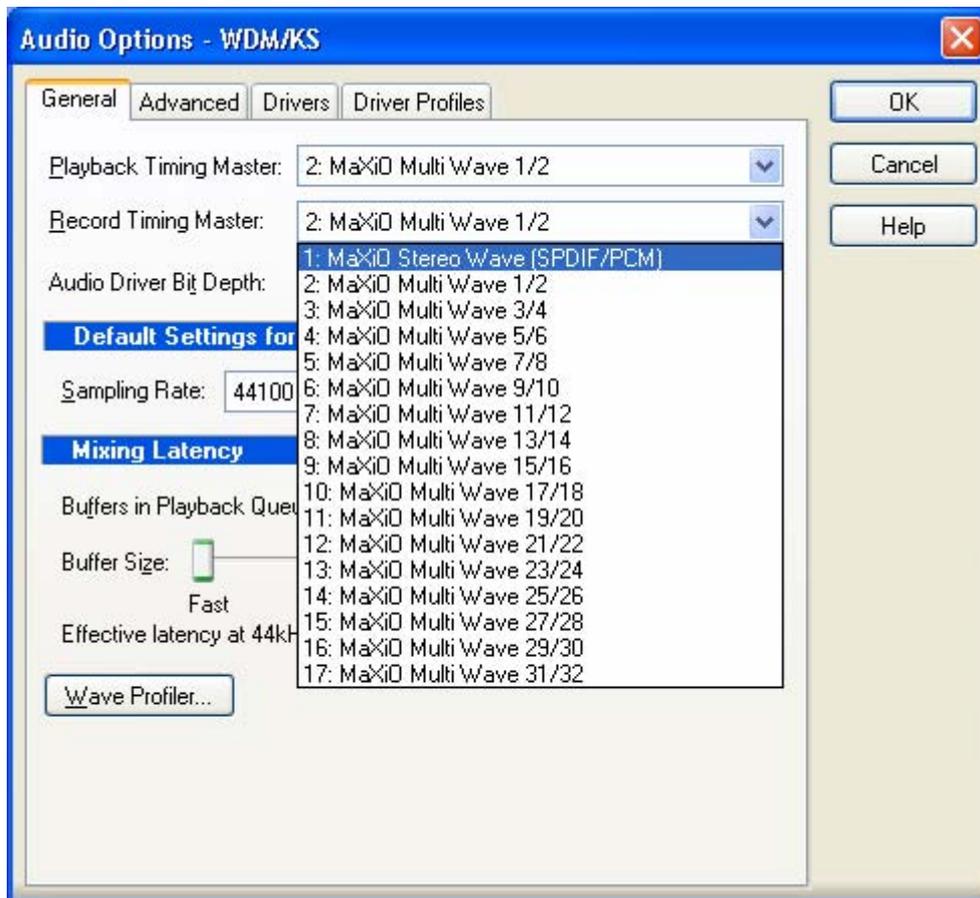
Note that the input and output drivers have to match each other. Restart SONAR after the settings have changed.

If you prefer the ASIO mode (which is supported in SONAR 2.2 and newer), first, change the *Driver Mode* to *ASIO* on the *Advanced* tab of as shown below. Then restart SONAR. Note that we recommend using ASIO instead of WDM/KS as the performance will be better.
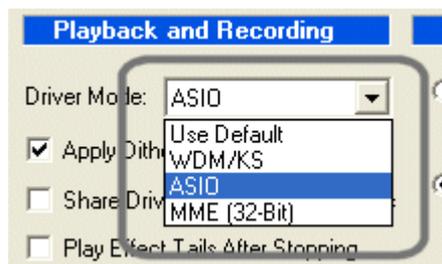
Then change all the settings as shown on the following picture:
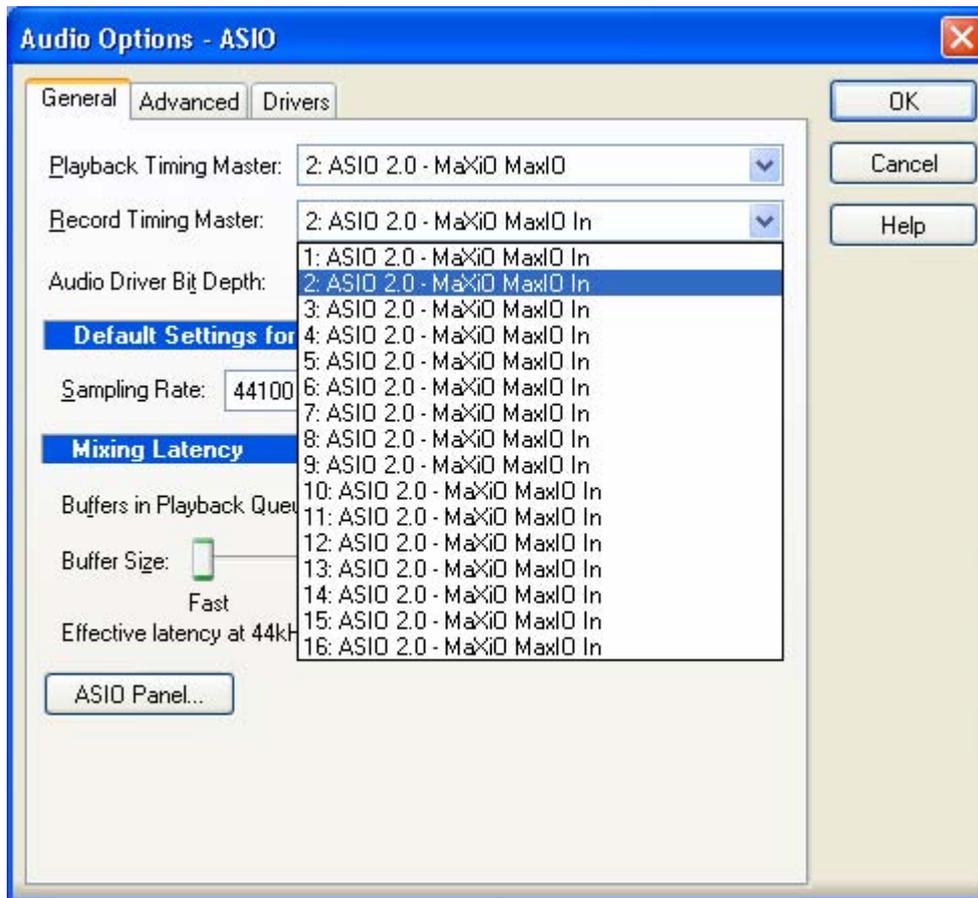
· Note: enabling SONAR's software input monitoring may introduce feedback loops. You MUST disable / mute MaXiO input monitoring before using SONAR's software input monitoring.

6.4 Wavelab

After launching Wavelab, go to *Options -> Preference -> Audio Card*. Select either *MME-WDM MaXiO Stereo Wave(SPDIF/PCM)* or *ASIO 2.0 –MaXiO*.
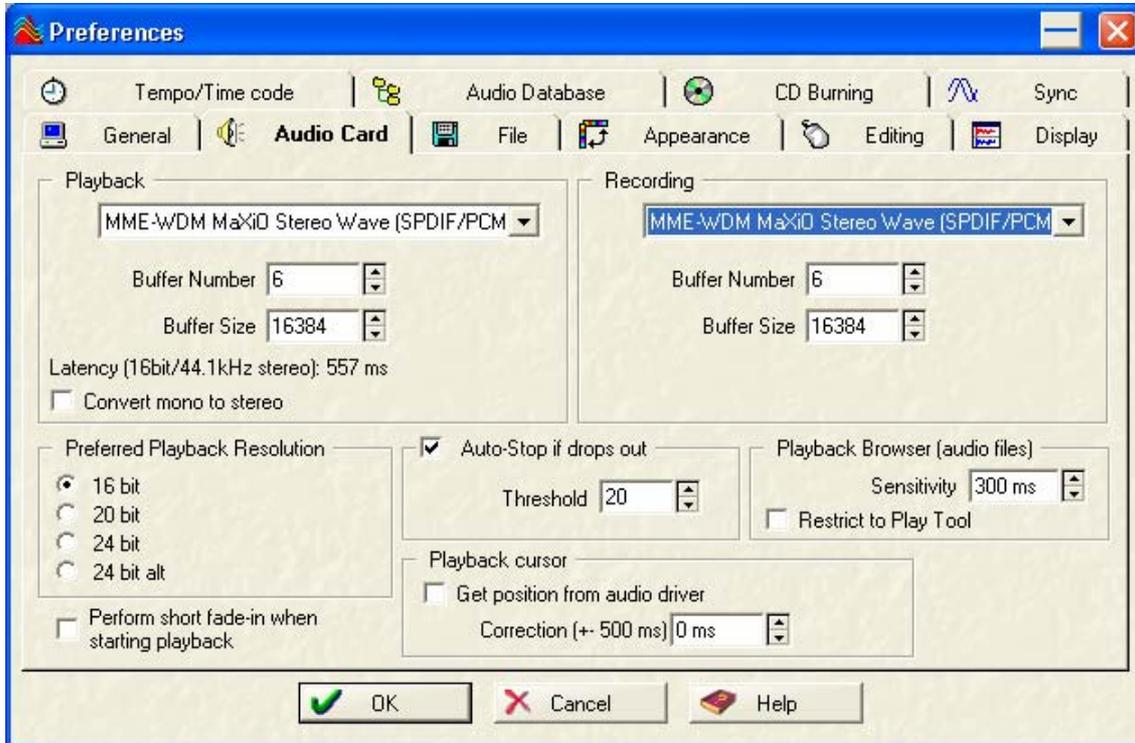
MME configuration
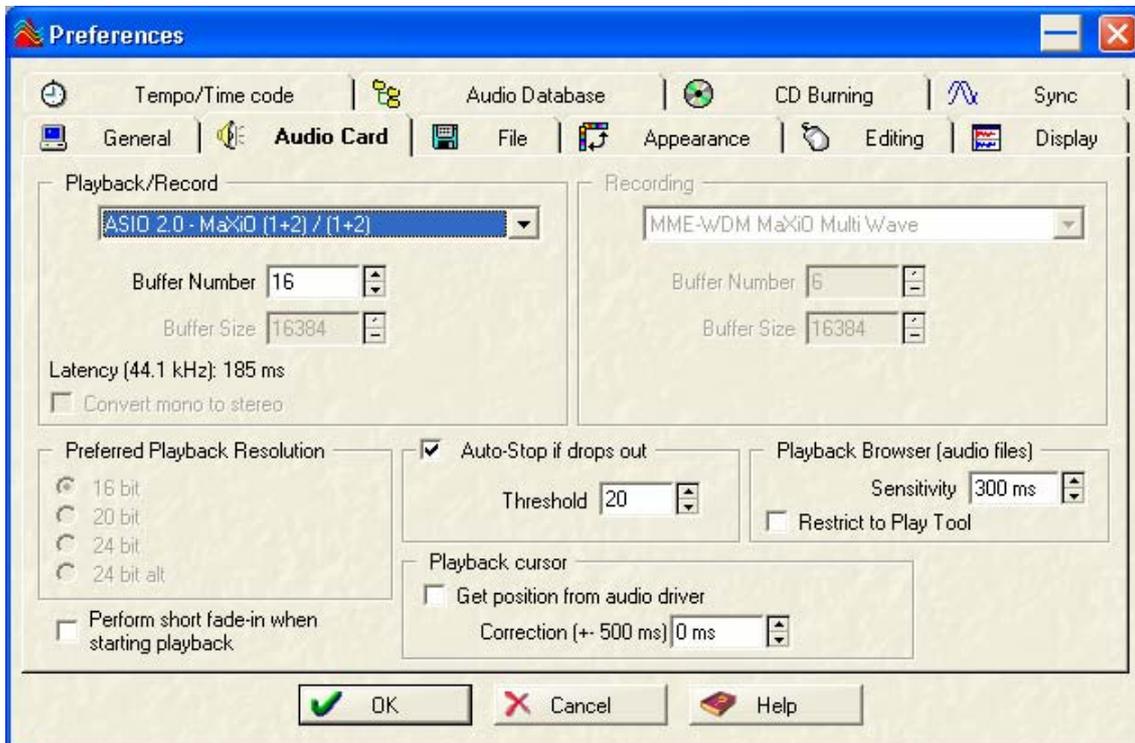
ASIO configuration

6.5 Tracktion

The MaXiO XD system comes bundled with the full version of Tracktion – a professional recording and MIDI production software by Mackie / Raw Material Software. After launching Tracktion, select *Settings* then go to the *audio devices* tab. Choose *ASIO 2.0 - MaXiO* as playback and record device as shown below.
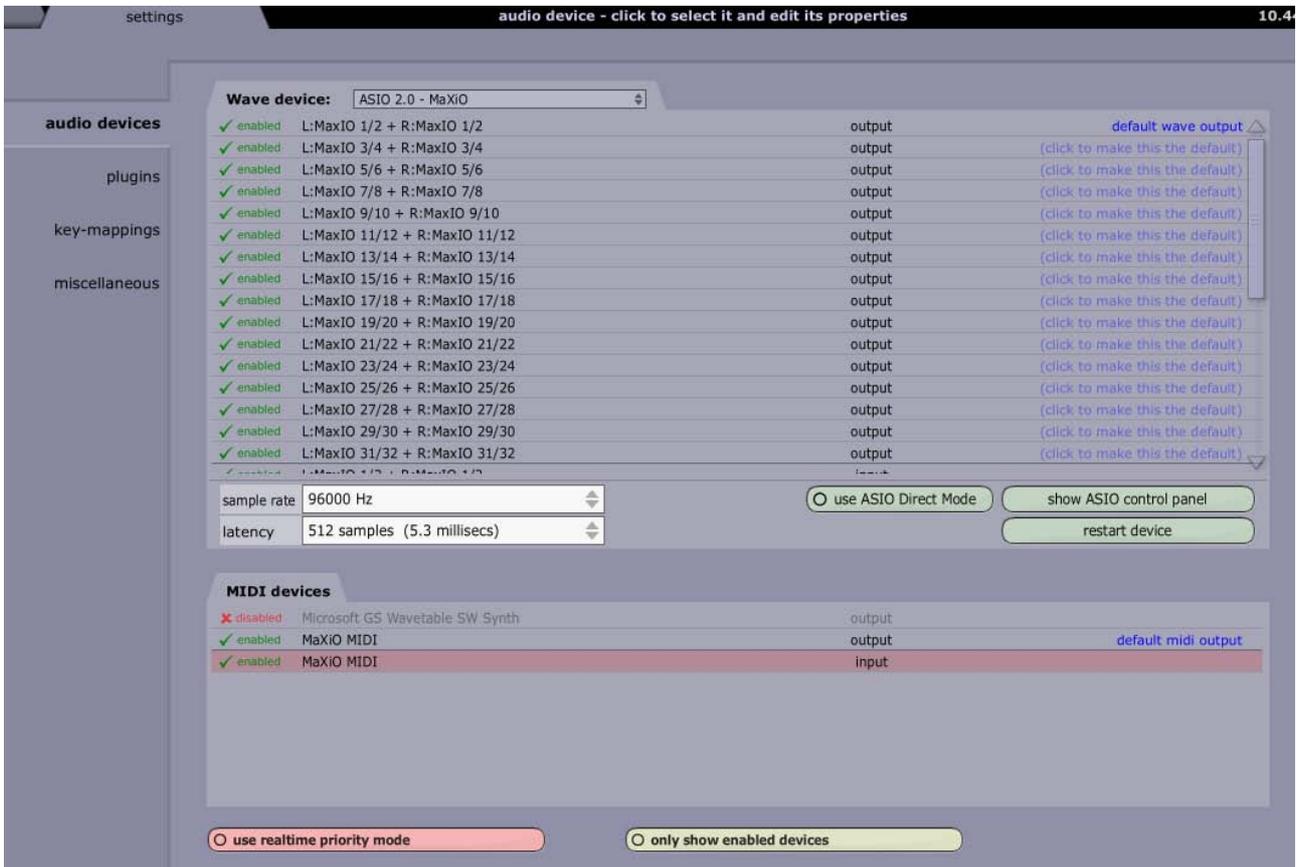
7. DirectWIRE 3.0

7.1 What is DirectWIRE?

DirectWIRE is a 100% purely digital wire!

DirectWIRE is a driver technology, developed by ESI, which can be used for routing audio streams internally within applications using EWDM Audio MIDI Drivers.

With the DirectWIRE router, an application can record from other application's audio outputs without external wiring or any loss of data when they are running at the same time.

DirectWIRE also allows you to easily rip any audio stream in real time by transferring data thru DirectWIRE from MP3s, live On-line Broadcast and On-demand content, and more.
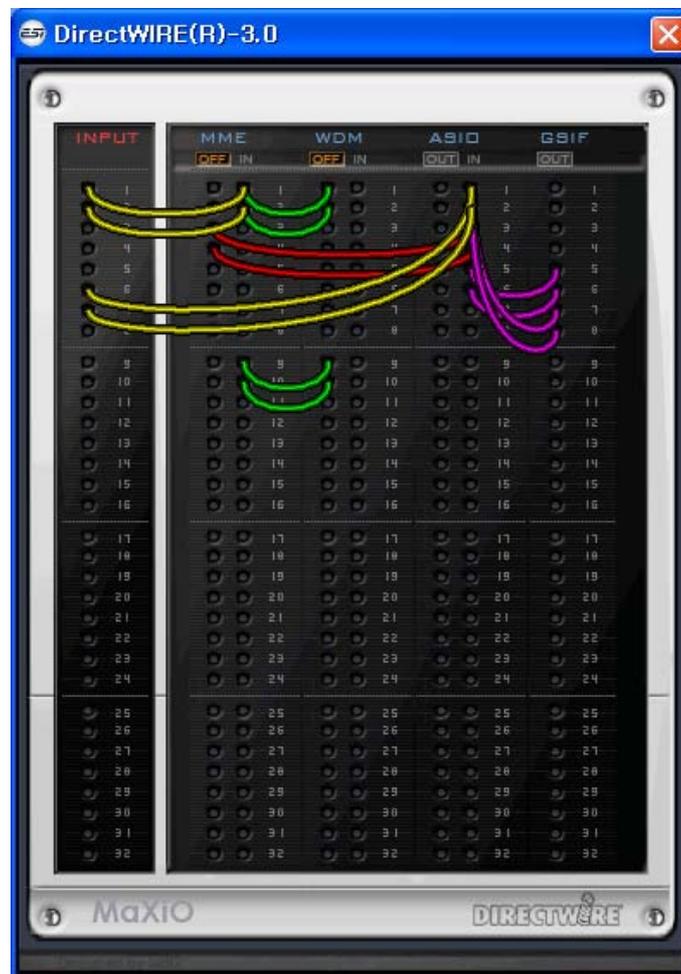
7.2 DirectWIRE Panel

Click on DirectWIRE on the MaXiO control panel. The DirectWIRE panel window as shown below will appear. DirectWIRE digital virtual wiring technology, developed by ESI, routes audio streams internally within applications using standard audio drivers such as WDM, ASIO and MME, even when they are running at the same time.

The number on the row represents the input or output port.

The columns represent ins and outs (on and off) of the respected drivers.

Patch the virtual cables from one point to another as you drag the mouse.

INPUT section is a new feature of DirectWIRE 3.0. It is used to route signals from MaXiO's hardware inputs.

MME section represents general application's I/O:
  Ex.) WinAmp, WaveLab (non ASIO mode), Cakewalk, Audition, Vegas, etc.

WDM section represents Multi-MME application's I/O:
  Ex.) SONAR (when using WDM/KS), PowerDVD, WinDVD, etc.

ASIO section represents ASIO application's I/O:
  Ex.) Cubase, Logic, Reason, Nuendo, SONAR (when using ASIO), Samplitude, etc.

GSIF section represents GSIF application like GigaStudio.

Note: some applications support multiple driver modes.

7.3 DirectWIRE examples

Example 1. Recording from WinAmp(MME) to WaveLab(MME):

Note: If you want to record what's played back in WinAmp, but don't want to hear the sound, you should click the 'OUT' button in the MME section so it'll change to 'OFF' (OFF).

Example 2. Recording from WinAmp(MME) to SONAR(WDM):

Example 3. Recording from WinAmp(MME) to Cubase, Logic, Nuendo(ASIO):
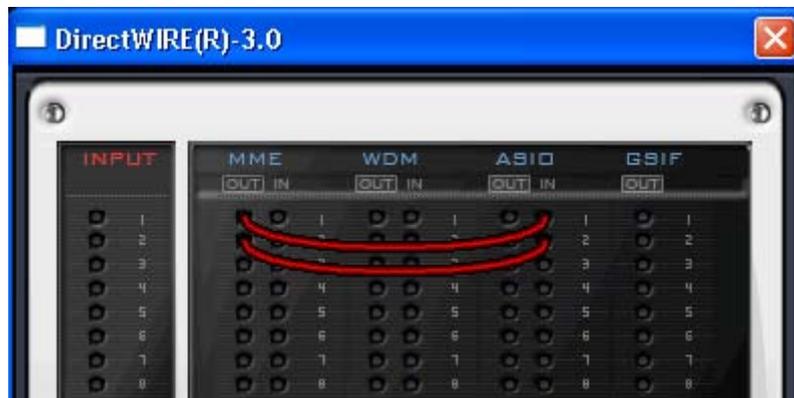
Example 4. Recording from GigaStudio(GSIF) to SONAR(WDM):

Example 5. Recording from GigaStudio(GSIF) to Cubase(ASIO):

Example 6. Let's say you want to quickly dub some vocal over an audio track. It's very simple with DirectWIRE 3.0, you just have to make connections similar to these:

8. Technical Specifications

MaXiO PCI host card

• General		
PCI Interface	32bit, PCI Bus-Mastering support PCI slot compatibility – designed to suit +3.3V and/or +5V PCI slot	
Audio	Total 32-in / 32-out, 24bit, audio interface Full Duplex - Simultaneous Record / Playback	
System Clock Support	Internal (44.1, 48.0, 88.2, 96.0, 176.4, 192.0 kHz), Word clock, Digital In, E.D.I	
MIDI I/O	1-in / 1-out 16 MIDI channel , Standard MIDI 5-pin DIN	
WORD Clock I/O	FS / 256*FS, BNC Connector	
• Digital Audio		
Coaxial (S/PDIF)	Connector Impedance Format Sample rate	RCA (Coaxial) I/O XLR : 110ohm, RCA : 75ohm IEC-60958 Professional / Consumer 44.1, 48.0, 88.2, 96.0, 176.4, 192.0 kHz
ADAT	Connector Format Sample rate	TOS-Link (Optical) I/O ADAT® protocol 44.1, 48.0kHz (8channel) 88.2, 96.0kHz (4channel - SMUX) 176.4, 192.0kHz (2channel - SMUX)
E.D.I	Connector / Cable Format Sample rate	IEEE1394 compatible E.D.I protocol (8-in / 8-out audio stream & control) 44.1, 48.0, 88.2, 96.0, 176.4, 192.0 kHz
M.D.I	Connector / Cable Format Sample rate	SCSI compatible / Exclusive M.D.I Cable 4 X E.D.I (32-in / 32-out audio stream) & MIDI 44.1, 48.0, 88.2, 96.0, 176.4, 192.0 kHz

EX8000

• General	
Type	19" rack mounted, digital audio interface
Audio	Total 8-in / 8-out, 24bit, audio interface
System Clock Support	Internal (44.1, 48.0, 88.2, 96.0, 176.4, 192.0 kHz), Word Clock, Digital In, E.D.I
WORD Clock IN	FS / 256*FS, BNC Connector
Power	AC IN 100V ~ 240V, 50Hz ~ 60Hz, 30W
Weight	3.5kg
Dimensions	482(mm) x 180(mm) x 86(mm)

• Analog Inputs		
Type	Balanced 1/4" TRS (Balanced XLR) Input	
Level	+4dBu Nominal (@-16.2dBFS) , +20.2dBu max	
Gain Range	0.0dB (@Gain min, +20.2dBu max) ~ +29.0dB (@Gain max, -7.8dBu max)	
Frequency Response	20Hz to 20kHz, +/- 0.1dB	
THD + N	0.0003% A-weighted (@ -3dBFS)	
Dynamic Range	116dB A-weighted	
CMRR	75dB	
Impedance	10K ohm (1/4" TRS), Low impedance : 3K ohm (XLR)	
A/D Converter	Type	24bit, 192KHz, 128X Oversampling
	Dynamic Range	123dB (@ -60dBFS with A-Weighted)
	S/(N+D) Ratio	110dB (@ -1dBFS, measurement method)
	Frequency Response	6.5 ~ 21.768KHz, +/- 0.001dB (@ fs=48KHz)
		6.5 ~ 43.536KHz, +/- 0.003dB (@ fs=96KHz)
		6.5 ~ 87.072KHz, +/- 0.007dB (@ fs=192KHz)
	Interchannel Isolation	123dB
	Gain Mismatch	0.1dB

• Microphone Pre-amp	
Type	Balanced XLR (+48V Phantom Power support)
Level	500 mV max (-3.8dBu)
Gain Range	+25.0dB (@Gain min, -3.8dBu) ~ +73dB (@Gain max, -51.8dBu)
Equivalent Input Noise	- 135.5dBu (@ 0 ohm, 20Hz ~ 20kHz)
THD + N	0.00065% A-weighted (@ gain+35dB)
Dynamic Range	103dB A-weighted (@ gain +35dB)
CMRR	90dB
Impedance	1.5K ohm

• Analog outputs		
Type	+4dBu Balanced XLR output	
	-10dBv Balanced/Unbalanced 1/4" TRS output	
Level	+4dBu Nominal (@-16dBFS) , +20.0dBu max	
	-10dBu Nominal (@-16dBFS) , +8.2dBu max	
Frequency Response	20Hz to 20kHz, +/- 0.05dB	
Analog Filter	3-pole low-pass filter	
THD + N	0.0001% A-weighted (@ -3dBFS)	
Dynamic Range	118dB A-weighted	
Impedance	110 ohm (1/4" TRS), 110 ohm (XLR)	
D/A Converter	Type	24bit, 192KHz, 128X Oversampling, 8 times digital filter
	Dynamic Range	120dB (@ -60dBFS with A-Weighted)
	S/(N+D) Ratio	100dB (@ -1dBFS, measurement method)
	Frequency Response	0 ~ 21.7KHz, +/- 0.002dB (@ fs=48KHz)
		0 ~ 43.5KHz, +/- 0.002dB (@ fs=96KHz)
		0 ~ 87.0KHz, +/- 0.002dB (@ fs=192KHz)
	Interchannel Isolation	120dB
	Gain Mismatch	0.15dB

• Digital Audio		
AES/EBU, Coaxial (S/PDIF)	Connector	XLR (AES/EBU), RCA (S/PDIF) I/O
	Impedance	XLR : 110ohm, RCA : 75ohm
	Format	IEC-60958 Professional / Consumer
	Sample rate	44.1, 48.0, 88.2, 96.0, 176.4, 192.0 kHz
ADAT	Connector	TOS-Link (Optical) I/O
	Format	ADAT® protocol
	Sample rate	44.1, 48.0kHz (8channel)
		88.2, 96.0kHz (4channel - SMUX)
		176.4, 192.0kHz (2channel - SMUX)
E.D.I	Connector	IEEE1394 compatible
	Format	E.D.I protocol
	Sample rate	44.1, 48.0, 88.2, 96.0, 176.4, 192.0 kHz (8 channel)

MaXiO 032 breakout box

• General		
Type	Half rack type, M.D.I Based Digital audio interface	
Audio	Total 32-in / 32-out, 24bit, audio interface	
System Clock Support	Internal (44.1, 48.0, 88.2, 96.0, 176.4, 192.0 kHz), Word Clock, Digital In, E.D.I	
MIDI I/O	1-in / 1-out 16 MIDI channel , Standard MIDI 5-pin DIN	
WORD Clock I/O	FS / 256*FS, BNC Connector	
Power	M.D.I Cable Power	
Weight	1,035g	
Dimensions	216(mm) x 160(mm) x 44(mm)	
• Analog Inputs		
Type	Balanced 1/4" TRS (Balanced XLR) Input	
Level	+4dBu Nominal (@-16.2dBFS) , +20.2dBu max	
Gain Range	0.0dB (@Gain min, +20.2dBu max) ~ +29.0dB (@Gain max, -7.8dBu max)	
Frequency Response	20Hz to 20kHz, +/- 0.1dB	
THD + N	0.0003% A-weighted (@ -3dBFS)	
Dynamic Range	116dB A-weighted	
CMRR	75dB	
Impedance	10K ohm (1/4" TRS), Low impedance : 3K ohm (XLR)	
A/D Converter	Type	24bit, 192KHz, 128X Oversampling
	Dynamic Range	123dB (@ -60dBFS with A-Weighted)
	S/(N+D) Ratio	110dB (@ -1dBFS, measurement method)
	Frequency Response	6.5 ~ 21.768KHz, +/- 0.001dB (@ fs=48KHz)
		6.5 ~ 43.536KHz, +/- 0.003dB (@ fs=96KHz)
		6.5 ~ 87.072KHz, +/- 0.007dB (@ fs=192KHz)
	Interchannel Isolation	123dB
	Gain Mismatch	0.1dB
• Microphone Pre-amp		
Type	Balanced XLR (+48V Phantom Power support)	
Level	500 mV max (-3.8dBu)	
Gain Range	+25.0dB (@Gain min, -3.8dBu) ~ +73dB (@Gain max, -51.8dBu)	
Equivalent Input Noise	- 135.5dBu (@ 0 ohm, 20Hz ~ 20kHz)	
THD + N	0.00065% A-weighted (@ gain+35dB)	
Dynamic Range	103dB A-weighted (@ gain +35dB)	
CMRR	90dB	
Impedance	1.5K ohm	
• Analog outputs		
Type	+4dBu Balanced XLR output	
	-10dBv Balanced/Unbalanced 1/4" TRS output	
Level	+4dBu Nominal (@-16dBFS) , +20.0dBu max	
	-10dBu Nominal (@-16dBFS) , +8.2dBu max	
Frequency Response	20Hz to 20kHz, +/- 0.05dB	
Analog Filter	3-pole low-pass filter	
THD + N	0.0001% A-weighted (@ -3dBFS)	
Dynamic Range	118dB A-weighted	
Impedance	110 ohm (1/4" TRS), 110 ohm (XLR)	
D/A Converter	Type	24bit, 192KHz, 128X Oversampling, 8 times digital filter
	Dynamic Range	120dB (@ -60dBFS with A-Weighted)
	S/(N+D) Ratio	100dB (@ -1dBFS, measurement method)
	Frequency Response	0 ~ 21.7KHz, +/- 0.002dB (@ fs=48KHz)
		0 ~ 43.5KHz, +/- 0.002dB (@ fs=96KHz)
		0 ~ 87.0KHz, +/- 0.002dB (@ fs=192KHz)
	Interchannel Isolation	120dB
	Gain Mismatch	0.15dB
• Digital Audio		
Coaxial (S/PDIF)	Connector	RCA (S/PDIF) I/O
	Impedance	RCA : 75ohm
	Format	IEC-60958 Professional / Consumer
	Sample rate	44.1, 48.0, 88.2, 96.0, 176.4, 192.0 kHz
ADAT	Connector	TOS-Link (Optical) I/O
	Format	ADAT® protocol
	Sample rate	44.1, 48.0kHz (8channel)
		88.2, 96.0kHz (4channel - SMUX)
		176.4, 192.0kHz (2channel - SMUX)

END USER WARRANTY

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End User Warranty
ESI warrants this product, under normal use, to be free of defects in materials and workmanship for a period of One(1) year from date of purchase, so long as: the product is owned by the original purchaser, with proof of purchase from an authorized ESI dealer. This warranty explicitly excludes power supplies and included cables which may become defective as a result of normal wear and tear.

In the event that ESI receives, from an original purchaser and within the warranty coverage period, written notice of defects in materials or workmanship, ESI will either replace the product, repair the product, or refund the purchase at its option. To obtain warranty service, the original purchaser or his authorized dealer must fill the support contact form at http://www.esi-pro.com. In the event repair is required, shipment to and from ESI and possible handling charges shall be borne by the purchaser. ESI will not accept returns without prepaid shipments. In the event that repair is required, a Return Authorization Number must be obtained from ESI. After this number is obtained, the unit should be shipped back to ESI in a protective package with a description of the problem and the Return Authorization Numer clearly written on the package. All such returns must be shipped to ESI headquarters in Seoul, Korea (or US Office).

In the event that ESI determines that the product requires repair because of user misuse or regular wear, it will assess a fair repair or replacement fee. The customer will have the option to pay this fee and have the unit repaired and returned, or not pay this fee and have the unit returned and un-repaired.

The remedy for breach of this warranty shall not include any other damages. ESI will not be liable for consequential, special, indirect, or similar damages or claims including loss of profit or any other commercial damage, even if its agents have been advised of the possibility of such damages, and in no event will ESI's liability for any damages to the purchaser or any other person exceed the price paid for the product., regardless of any form of the claim. ESI specifically disclaims all other warranties, expressed or implied. Specifically, ESI makes no warranty that the product is fit for any particular purpose.

The FCC and CE Regulation Warning FC CE

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Caution: Any changes or modifications in construction of this device with are not expressly approved by the party responsible for compliance, could void the user's authority to operate equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. If necessary, consult an experienced radio/television technician for additional suggestions.

Correspondence
For technical support inquiries, contact your nearest dealer, local ESI distributor or ESI directly at:

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· All features and specifications subject to change without notice.
· Parts of this manual are continually being updated. Please check our web site www.esi-pro.com occasionally for the most recent update information.