marian
DIGITAL AUDIO ELECTRONICS

MARC 2

User's Guide

CE

The Marc 2 conforms the following standards:
EN 55022: 1998 + A1: 2000 + A2: 2003; class A
EN 55024: 1998 + A1: 2000 + A2: 2003; class A

In order for an installation of this product maintain compliance with the limits of a class A device, shielded audio cables must be used, not longer than 50 cm. Attention: This is a device of the class A and can cause interference to radio or television reception within the residential area. The user is encouraged to try to correct the interference by suitable measures.

Table of Contents

Welcome

Congratulations and thank you for choosing the Marc 2 as your high-end audio device with all the technology required for high-quality digital audio-productions.

Please consider taking some time to study this guide. Besides traditional installation and operation instructions it contains information that will make the handling with the MARC 2 easier for you.

We wish you lots of fun and success in working with the MARC 2.

1. Features

Your MARC 2 provides some special characteristics. In the following you will get a short overview of them:

- 1 Stereo Analog Input
- 1 Stereo Analog Output
- 1 S/PDIF Input
- 1 S/PDIF Output
- Supports 24 Bit and 96 kHz
- DAT-Marker Support
- Switchable „Non-Audio-Mode“ for external Surround Decoders
- Multiple Card Support (up to 4 cards can be installed)
- Integrated Synchronization Bus (MARIAN SyncBus)
- Hardware Signal Monitoring (flexible and latency free)

2. Scope of Supply

The MARC 2 Audio System comes packaged with the following:

- MARC 2 PCI Sound System
- Cable for digital audio CD input
- User's Guide
- CD-ROM (driver set)
- Bundlesoftware

3. System Requirements

In order to be able to operate the MARC 2, your PC should meet the following requirements:

- AT compatible PC with a spare PCI slot (32 Bit, 33 MHz, 5V)
- Pentium processor or AMD
- Windows™ 95/98/ME/NT4/2000/XP
- Microsoft DirectX 9

Please note that your used audio software may ask for different requirements.

4. Ports

4.1 External Ports

This picture shows the slot bracket of your MARC 2 with the external audio ports.

Analog Output (¼" TRS jack)

Analog Input (¼" TRS jack)

S/PDIF Output (RCA)

S/PDIF Input (RCA)

S/PDIF Output (TOSLINK)

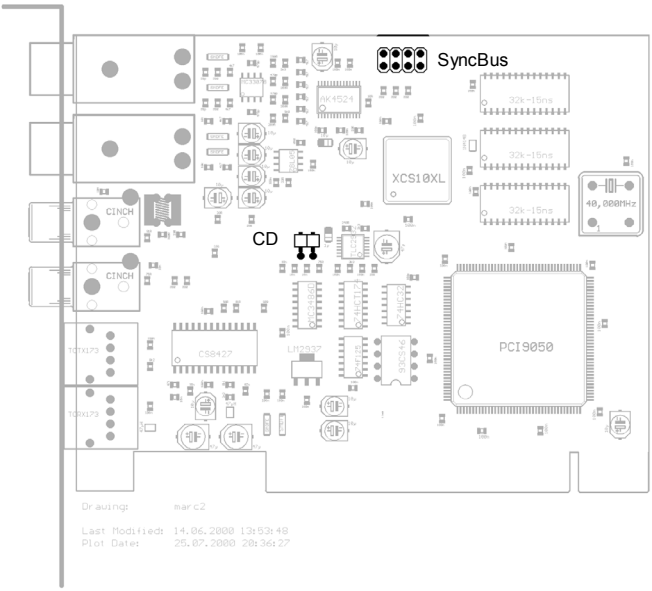
S/PDIF Input (TOSLINK)

For using the analog audio ports of the MARC 2 two cables, equipped with a 1/4" TRS plug at the MARC side end, will be required. The plugs at the other end of the cable depend upon the ports of the device, which is to be connected.

For using the digital audio ports of the MARC 2 two cables with RCA plugs at the MARC side end and/or two light pipe cables will be required. The RCA digital output always carries the same signal like the optical digital output. Use the MARC 2 Manager to select the optical or electrical digital input as your recording source. See chapter “7.3 Digital Input”.

4.2 Internal Ports

There are two connectors on the MARC 2 sound system PCB.



4.2.1 SyncBus Connector

If you use several MARC 2 or other MARIAN sound systems, you need to connect the SyncBus ports of the individual cards using a cable which is available as accessory.

The SyncBus of your MARC 2 has two jobs: on one side it synchronizes the digital clock and ensures that several cards run synchronously when they operated parallely. On the other side it takes care of the concurrent and sample-accurate starting and stopping of several internal audio devices. “Audio devices” in this case refer to either sound cards with SyncBus or even inputs and outputs of one and the same card.

For details on the settings see chapter “7.6.1 Synchronization”

4.2.2 Digital Audio CD Connector

If your CD-ROM drive provides a digital audio output (2-pin electrical S/PDIF) then you may connect this with the MARC 2 digital CD input. Use the MARC 2 Manager to select this input as your recording source. See chapter “7.3 Digital Input”.

5. Hardware Installation

1. Switch off the computer and all other attached devices. Disconnect the power supply.
2. Open the chassis with a screwdriver and take it off the computer.
3. Remove the card from the anti-static foil, but do not touch the electronic parts of the card. Make sure to hold the card only at its edges.
4. Insert the card carefully into the PCI slot. Ensure that the card was inserted properly into the slot.
5. Screw the card on the slot bracket to the case.
6. If required, connect the digital audio output of your internal CD/DVD drive with the digital audio CD input of the MARC 2. If you want to use multiple MARIAN sound systems parallel, then connect them using the SyncBus. Please note the correct ports described in chapter “4.2 Internal Ports”
7. Close the PC case and reconnect the power supply.

6. Driver Installation

6.1 About MME, DirectX, WDM-Audio, ASIO and GSIF

You can use the MARC 2 with many audio software applications. The MARC 2 driver software with its interfaces will make it possible. An audio application uses a driver interface to transfer the audio data to and from the MARC 2 hardware. In many audio applications you may setup a specific driver interface to be used.

For connecting software and hardware you can use the driver interfaces MME, DirectX or DirectSound, WDM-Audio, ASIO 2.0 and the Tascam GigaSampler Interface (GSIF). WDM-Audio can be used with Windows™ 2000/XP, only.

You can configure several driver interfaces according to your personal needs. Please refer chapter “7.6.2 Audio Settings on Windows™ 98/ME” and “7.6.3 Audio Settings on Windows™ 2000/XP”.

If you use ASIO compatible audio software, you will achieve extremely higher performance of the system as well as shorter latency periods. In an ideal case 2 ms are possible!

6.2 Windows 95 (Release 950 and 95a)

1. Start your PC after installing your hardware.
2. Windows automatically recognizes at startup the newly installed device and starts the Hardware Wizard.
3. The "A new hardware component was found" window appears.
4. When selecting the driver which is to be installed, please select the option "*Driver from disk provided by hardware manufacturer*" and confirm your selection.
5. Insert the supplied CD in your CD-ROM drive.
6. Select your CD-ROM drive using the "Browse" button, change to *marc2\win9x\english* directory and confirm your selection. Windows copies the driver files and installs the MARC 2.
7. After finishing the installation, your MARC 2 is ready to be operated without having to restart the system.

6.3 Windows 95 (Release 95b and 95c)

1. Start your PC after installing your hardware.
2. Windows automatically recognizes at startup the newly installed device and starts the Hardware Wizard.
3. The "Wizard for device driver updates" appears.
4. Insert the supplied CD in your CD-ROM drive and click *"Next"*.
5. Windows now searches for the updated drivers, but it cannot find any. Click *"Other position"* and click "*Browse*" in the opening window. Change into the *marc2\win9x\english* directory on the CD and confirm it by clicking the *"OK"* button.
6. Windows copies the driver files and installs the MARC 2. During this process you are asked again for the driver's directory. Select the directory as described previously in step 5.
7. After finishing the installation, your MARC 2 is ready to be operated without having to restart the system.

6.4 Windows 98

1. Start your PC after installing your hardware.
2. Windows automatically recognizes at startup the newly installed device and starts the Hardware Wizard.
3. During the start of Windows the Hardware Wizard searches for new drivers. Click *"Next"* to start the search.
4. Enable the *"Search for the best driver for your device"* option and confirm by clicking *"Next"*.
5. Insert the supplied CD in your CD-ROM drive.
6. Select your CD-ROM drive in the next dialog, change into the *marc2\win9x\english* directory and then click *"Next"*. The *Hardware Wizard* searches the CD-ROM for the appropriate drivers and finally displays the names of the drivers.
7. Click *"Next"*; Windows copies the driver files and installs the MARC 2.
8. After finishing the installation click *"Finish"*. The driver will be enabled and the MARC 2 is ready to be operated without having to restart the system.

6.5 Windows ME

1. Start your PC after installing the hardware.
2. At startup Windows automatically recognizes the newly installed device and starts the Hardware Wizard.
3. Insert the supplied CD in your CD-ROM drive.
4. Enable the *"Search for the best driver for your device"* option and confirm by clicking *"Next"*.
5. The Windows Hardware Wizard now searches for the best drivers and finds all MARC 2 drivers on the CD. Choose the drivers for Windows 95/98/ME (folder *"\marc2\win9x"*) and your preferred language. Confirm this dialog with *„Next"*
6. Windows copies the driver files and installs the MARC 2.
7. After finishing the installation click *"Finish"*. The driver will be enabled and the MARC 2 is ready to be operated without having to restart the system.

6.6 Windows NT 4.0

1. Start your PC after installing your hardware.
2. Log in using administrator rights.
3. Open "*System Control*" and choose *"Multimedia"*, then change to the *"Devices"* tab.
4. Click the *"Add"* button and confirm the opening window by clicking *"OK"*.
5. Insert the supplied CD in your CD-ROM drive.
6. The *"Install driver"* window opens. Click "*Browse*", select your CD-ROM drive and on the CD-ROM select the *marc2\nt4\english* directory.
7. Confirm your selection by clicking *"OK"*. Windows shows the recognized drivers in the *"Unlisted or Updated Driver"* window.
8. Confirm the window by clicking *"OK"*. The driver files are then copied.
9. Then the MARC 2 is available without having to restart the system.

6.7 Windows 2000

1. Start your PC after installing your hardware.
2. Log in using administrator rights.
3. Windows automatically recognizes at startup the newly installed device and starts the Hardware Wizard.
4. During the start of Windows the Hardware Wizard searches for new drivers. Click "Next" to start the search.
5. Enable the “Search for the best driver for your device” option and confirm by clicking "Next".
6. Insert the supplied CD in your CD-ROM drive.
7. Confirm the next dialog with „Next“
8. Confirm the next window also with „Next“
9. Ignore the message „Digital signature not found“ and continue the installation with „Yes“
10. Windows copies the driver files and installs the MARC 2.
11. After finishing the installation click "Finish” and restart Windows™ 2000.

6.8 Windows XP

1. Start your PC after installing your hardware.
2. Log in using administrator rights.
3. Insert the supplied CD in your CD-ROM drive.
4. Windows automatically recognizes at startup the newly installed device and starts the Hardware Wizard.
5. Enable the option „Install Software automatically“ and confirm by clicking „Next“.
6. Ignore the next message and click „Continue“
7. Windows copies the driver files and installs the MARC 2.
8. After finishing the installation the MARC 2 is ready to be operated without having to restart the system.

6.9 Driver Updates

Sometimes we offer a driver update for the MARC 2 in the download area of the MARIAN homepage. This may include:

- functional improvements of the driver and/or the manager
- adjustments to new operating systems and/or their new components (updates and service packs)
- improvements of compatibility towards other audio applications

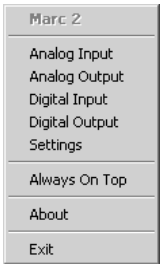
In case of a driver update, please follow the instructions of the "readme.htm" file. This file is included in the packed folder of the new driver files.

7. MARC 2 Manager

The MARC 2 has an extensive and useful setup. Immediately after installation the MARC 2 Manager symbol appears in the Windows taskbar.

Windows™ 98/ME

You open the MARC-Manager by double-clicking the taskbar symbol. The dialog box with checkboxes is then displayed.



Windows™ 2000/XP

With a single mouse-click you can open a menu, in which you can select what kind of settings you want to change.

„Analog Input“ opens the window where you can change the signal routing and monitor modes for the analog input. Additional, you can control the input signal levels. Chapter “7.1 Analog Input” explains these settings in detail.

„Analog Output“ opens a window where you can change the signal routing for the analog output. Additional, you can control the output signal levels. Chapter “7.2 Analog Output” explains these settings in detail.

„Digital Input” opens window where you can change the signal routing and monitor modes for the digital input. Additional, you can check on the input signal levels. Chapter “7.3 Digital Input” explains these settings in detail.

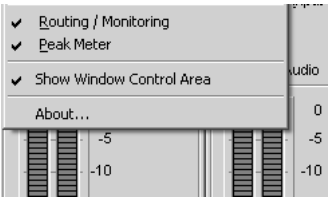
*„Digital Output“*opens a window where you can change the signal routing and the digital format for the digital output. Additional, you can check on the output signal levels. Chapter “7.4 Digital Output” explains these settings in detail.

„Settings“ opens a window where you can change clock settings and synchronization settings, Tascam GigaStudio parameters and other operating system dependent options. In chapter “7.6 Settings” these settings are explained in detail.

„Always On Top“: Activate this option to get the MARC 2 Manager windows on top of all other desktop windows – even if the MARC 2 Manager is not the active foreground application.

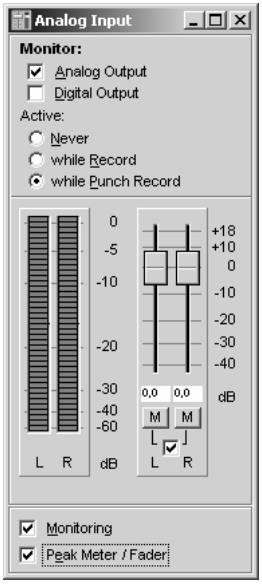
„About“ opens a window with version and contact information.

„Exit“ will end the the MARC 2 Manager application software.



Every MARC 2 Manager window has a window menu, which can be opened by a right click at the title bar. This menu has additional menu entries, which can be used to show and hide the single window sections. The sections at the bottom if each window can be shown/hidden by *“Show Window Control Area”*.

7.1 Analog Input



This dialog gives you the possibility to control the analog input.

Monitor: These options define the outputs and the situation for the automatic input monitoring. Chapter "7.5 Monitor Settings" explains these settings more detailed.

The **Peak-Meters** show the level of the left and the right input channels between -60 dbFS and 0 dbFS.

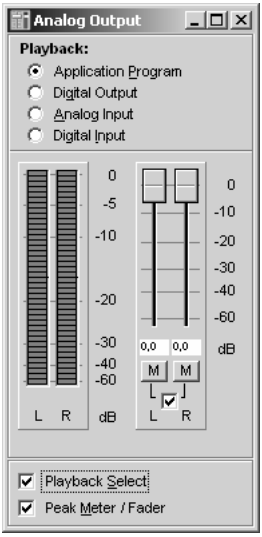
Using the **Faders** you can raise the analog input level by 18 dB or lower it by -40 dB. A double click at the faders resets the input level adjustment to 0 dB. You may also set the input level adjustment by your keyboard. Simply click into the edit fields below the faders and type in the required value. End your input with the return key.

The **"M" (Mute)** button switches the audio signal of the channel on and off.

The checkbox below the mute buttons is a **channel link button**, which synchronizes the faders of the left and right channel.

In addition you can switch off the monitoring and peak meter/fader section individually.

7.2 Analog Output



This dialog gives you the possibility to control analog outputs. This window provides high-definition peak meters to control the outgoing audio signal. You will also find a pair of faders which can be used to reduce the output level.

Playback: Here you can select the source signal for the analog output. These settings are independent of the automatic input monitoring. Chapter "7.5 Monitor Settings" explains this more detailed.

Please note: When the analog input is active (via record, activated input peak meters or monitoring) you are not allowed to set a digital signal as source for the analog output.

Peak Meters: The analog output has two channel peak meters which show you the range from -60 dbFS to 0 dbFS. We have also included a peak hold.

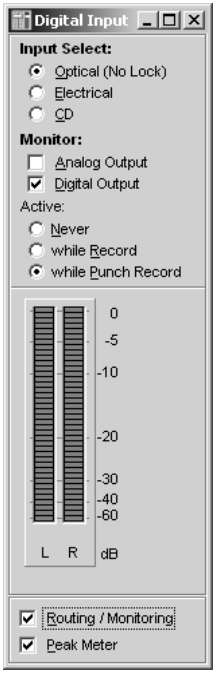
Faders: With these faders you can reduce the analog output level by 60 dB. A double click at the faders resets the output level adjustment to 0 dB. You may also set the output level adjustment by your keyboard. Simply click into the edit fields below the faders and type in the required value. End your input with the return key.

The **"M" (Mute)** button switches the audio signal of the channel on and off.

The checkbox below the mute buttons is a **channel link button**, which synchronizes the faders of the left and right channel.

In addition you can individually switch off the playback and peak meter/fader section.

7.3 Digital Input



This dialog configures and controls digital input. The MARC 2 is equipped with both electrical and optical digital inputs. In addition you can connect the digital output (S/PDIF) of an internal CD/DVD drive directly with the MARC 2.

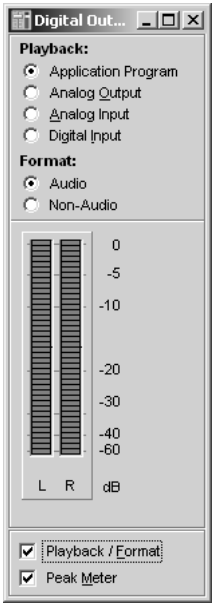
Input Select: Choose here whether you want to use the TOSLINK input (*"Optical"*), the RCA input (*"Electrical"*) or the digital audio CD input (*"CD"*) as source for a digital recording. The state of the selected input source is stated as *"Lock"*, if a valid digital signal is detected at the input or as *"No Lock"*, if not.

Monitor: These options define the outputs and the situation for the automatic input monitoring. Chapter "7.5 Monitor Settings" explains these settings more detailed.

Peak Meters: The digital input has two channel peak meters which show you the range from -60 dB to 0 dB. We have also included a peak hold.

In addition you can switch-off the peak meter section and routing/monitor section individually.

7.4 Digital Output



Use this dialog to control the digital output.

Playback: Here you can select the source signal for the digital output. These settings are independent of the automatic input monitoring. Chapter "7.5 Monitor Settings" explains this more detailed.

Please note: When the digital input is active (via record, activated input peak meters or monitoring) you are not allowed to set an analog signal as source for the digital output.

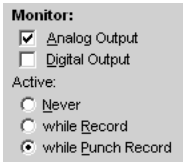
Format: Here you define whether the digital output data are signed as *"Audio"* or *"Non-Audio"* data. That's especially important if your playback application sends surround-coded signals (AC3, DTS, THX) to the digital output of the MARC 2. Often, external surround decoders "understand" this signal only, if it is signed as *"Non-Audio"*.

Peak Meters: The digital output has two channel peak meters which show you the range from -60 dbFS to 0 dbFS. We have also included a peak hold.

In addition you can switch-off the playback/format section and the peak meter section individually.

7.5 Monitor Settings

These settings have an effect only if you work with DirectSound or MME. If you are using ASIO or GSIF then the according audio application has the control over monitoring.



This picture shows the automatic monitor settings in the input windows of the MARC 2 Manager.

„Analog Output“ and *„Digital Output“*

The according input signal is routed to the activated output, when the determined monitor situation occurs.

„Never“

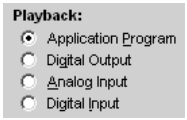
Means, automatic monitoring is switched off.

„While Record“

Means, the input signal is routed to the activated output(s) only during recording from the according input.

„While Punch Record“

Means, the input signal is routed to the activated output only during a Punch In/Punch Out recording. This is a very special function which requires the appropriate command to be sent from the application to the driver.



This picture shows the signal routing settings in the output windows of the MARC 2 Manager. These settings apply, if the situation for the automatic input monitoring is not active.

„Application Program“

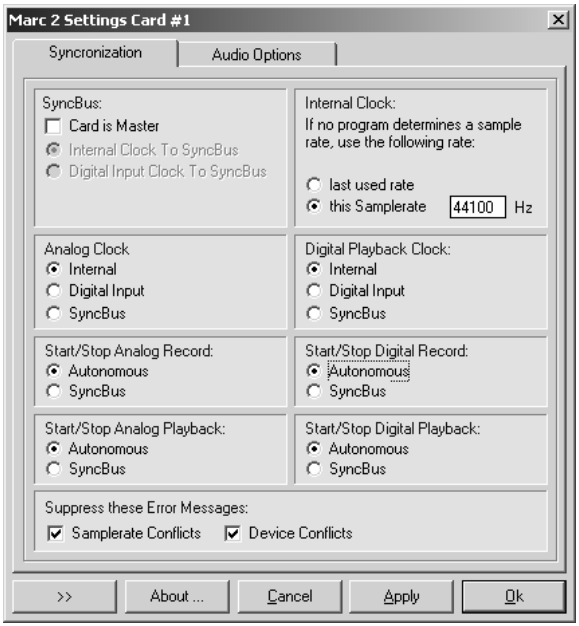
If active, you will hear the playback signal of an application at the according output.

„Digital Output“, *„Analog Input“*and *„Digital Input“*

Switches the chosen signal to the according output of the MARC 2.

7.6 Settings

7.6.1 Synchronization



In this window synchronization settings for the MARC 2 are handled.

Please note that these settings do not influence the function of the audio applications which use ASIO or GSIF driver interface. In this case the settings are determined by the audio application or automatically.

What's a clock?

The clock is a measure which directs all digital devices in a digital device environment. The clock is necessary for the synchronous operation and the data transfer of digital devices. If the devices are directed by the same clock, they will work simultaneously in terms of audio synchronization (this is not sequencer/Daw remote controlling or likewise). If there is no clock for a device, you cannot perform any recording or playback on this device.

7.6.1.1 SyncBus

The MARIAN SyncBus has to do two different jobs:

1. The MARIAN SyncBus synchronizes the digital clock. (To cope with the effect of two soundcards which normally tend to run apart.)
2. Different sound cards tend to start at slightly different starting points. This is an important issue, for example when the sound card has to synchronize its analog and digital output. If the SyncBus is setup correctly you will have a perfect synced system regarding digital clock and start/ stop off all devices controlled by the SyncBus.

By using the term "synchronization" we don't refer to the word in a "musical" way, like the synchronization of a tape machine and a sequencer. Synchronization between digital audio devices means recording and playback will start and run with sample accuracy.

The problem is: If you use several unsynchronized audio devices in one computer system you will encounter that the individual cards won't be able to run at exactly the same sample rate. Even with high-end audio cards it is not likely to run the analog and the digital input in sync. But if you use MARIAN sound systems you can perfectly synchronize the different devices using the SyncBus.

In case you wish to use the devices separately, you can switch off the SyncBus for each card in the system individually. Two MARIAN cards can be synchronized on sample-based tightness while another is independent and runs sync-free.

“Card is master”

Means that the MARC 2 is a clock master and is responsible to provide the clock on the SyncBus.

If several cards are to be synchronized using the SyncBus, exactly one card has to be configured as master. For all other cards the “Card is master” option needs to be disabled.

“Internal clock to SyncBus”

If this field is active, the sample rate of the internal clock generator is transferred to the SyncBus. It will be used as clock reference by cards, which are configured as SyncBus slaves,.

"Digital Input Clock to SyncBus"

Means that the clock of the signal at the digital input of the MARC 2 is transferred to the SyncBus.

Please note: that in this case all devices which are synchronized via SyncBus will not work properly if there is no valid signal at the digital input of the MARC 2.

7.6.1.2 Internal Clock

In this section you can determine, which sample rate is generated by the clock generator, if the sample rate is not given by any audio application. This sample rate is used for e.g. for signal monitoring. In addition, the digital output will use this sample rate, if its clock source is the internal clock. This is possibly important for external connected devices because they will use this signal to lock on.

Some audio applications end the communication with the audio driver, if you stop a recording or playback. In this case the driver sets the sample rate which was set here. If this sample rate is different from your project sample rate, some click noises may occur when you start and stop recording or playback. If this is the case, setup you project sample rate here or chose the option *"Last used Rate" to avoid these audible artifacts.*

7.6.1.3 Clock Synchronization

Three different clock sources are available for each device except the digital input: *"Internal"*, *"Digital Input"* and *"SyncBus"*.

"Internal"

If you use this clock source, then the sample rate for the device is generated by the internal clock generator. For devices which are connected with this clock source, an audio application is able to determine the sample rate, because the internal clock source works independently from external clocks (which cannot be influenced by the MARC 2).

"Digital Input Clock"

If you use this clock source, the connected device will always run at the sample rate of this clock. In this case the device works clock synchronized with the digital recording device. You have to ensure, that the device, which is connected at the digital input, generates a valid S/PDIF signal and therefore a valid clock. If a device is connected with this clock source, the sample rate can not be determined by an audio application.

"SyncBus"

If you use this clock source, the connected device will always run at the sample rate of this clock. In this case the device works clock synchronized with all devices which are synchronized with the SyncBus. If a device is connected with this clock source, the sample rate can not be determined by an audio application. The audio application has to control the sample rate of a device at the SyncBus-Master-Card to be able to set the sample rate.

7.6.1.4 Start/Stop Synchronization

Using the „*Start/Stop*„ options you can decide whether the start and stop of playback and recording shall be executed sample synchronously or whether the according devices shall operate independently from each other like different sound cards. (hint: "Start/Stop" does not refer to synchronizing sequencers or daw audio application concerning their playback control functions)

„Autonomous"

The device does not process a SyncBus signals – it runs standalone. This setting is e.g. useful if different audio applications access the MARC 2 devices separately.

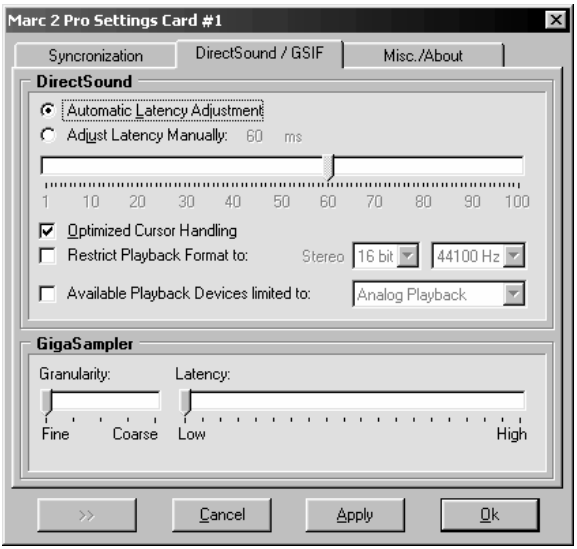
„SyncBus"

The device processes the SyncBus signals and synchronizes its start and stop with these signals. Thus, recording and playback of all devices with this option activated will be started and stopped exactly at the same sample moment.

On Windows™ 2000/XP there are some restrictions using this option. Please refer chapter "7.6.3.1 WDM, MME and DirectSound"

7.6.2 Audio Settings on Windows™ 98/ME

7.6.2.1 DirectSound



Automatic Latency Adjustment

If this option is active the driver will check the system performance in regular intervals. This results in short latencies and optimal system stability due to the fact that the MARC 2 will only load a certain amount of required data into the buffers. Of course there will be some situations where you will get better results by manually optimizing the buffers. In this case the card will use a permanent buffer setting. If you notice pops, clicks or other noticeable distortions of your audio material, you should use higher values for latency.

Optimized Cursor Handling

By clicking this option the MARC 2 sound system will try to adjust the latency behavior to the internal positioning of the respective host software. Please observe the reaction of your software and judge for yourself if this option works with the specific piece of software.

Restrict Playback Format to

Within the coordination of different audio programs and DirectSound it can occur that the hardware driver is opened by the DirectX system using a different sample format than the program was going to use. The resulting format conversion can have negative impact on the system's performance. If the playback of the DirectSound system does not sound correct please shut down the respective programs and start the MARC 2 Manager. Click "Settings" and restrict the sample format to the one that you wish to use in your application programs. This will force the DirectX system to open the hardware driver running ONLY the respective sample format. The real-time format conversion by the DirectSound system will be avoided, if the adjusted format value matches that of the application.

Available Playback Devices limited to […]

If you use a DirectSound application which doesn't leave you a choice to define an output device, you should use this option. By choosing "No device available" you will disable the DirectSound support.

7.6.2.2 GSIF

Some information in advance: The ideal settings for the usage of GSIF are dependent on some factors in your PC. We cannot inform you about the ideal settings for GSIF but will explain to you, what the terms stand for. In order to find the most suitable settings you will have to test.

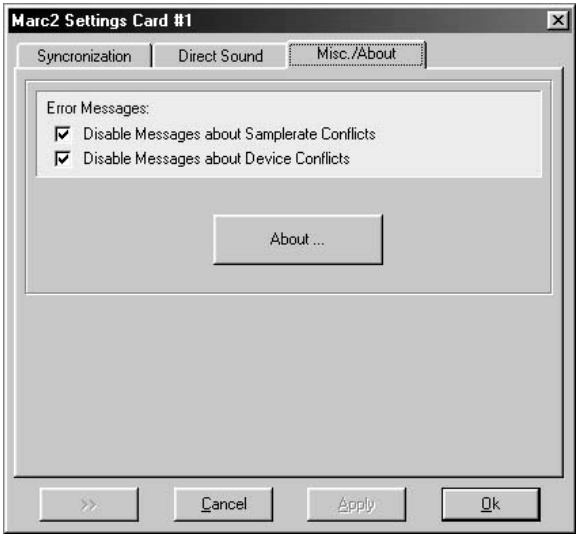
"Granularity" and *"Latency"*

The granularity specifies the size of the audio data blocks, which are transferred to the hardware by the GigaSampler. The smaller the latency was set, the smaller will have to be the data blocks, in order to avoid interruption during playback (granularity: "*Fine*"). Though the system is more stressed because of the larger data overhead during the transfer, the reaction time for the sampler playback is shorter.

Larger data blocks (granularity: "*Coarse*") stress the system less, but the reaction time is longer and easier leads to interruptions during playback.

For ideal results try to set the values of the two faders as low as possible without audio disruption occuring.

7.6.2.3 Misc. /About



Here you will find some other useful features which are described as follows:

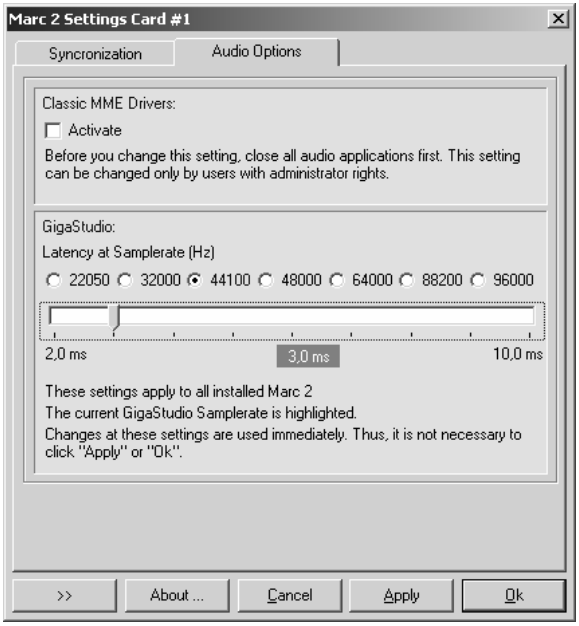
Error Messages

Some audio programs frequently test all available sound devices of the system. This can lead to obstructive error messages that just impede working with your audio software. You can easily switch off those error messages using the MARC 2 Manager. Please note that in case that you have a real problem, you won't see the error codes, which might help you in figuring out what is going on. Reactivate the error messages in this case.

About

Clicking this option will show you the developers e-mail address and the version number of your MARC 2 driver set.

7.6.3 Audio Settings on Windows™ 2000/XP



7.6.3.1 WDM, MME and DirectSound

Audio applications, which do not use ASIO, GSIF or direct WDM-Audio (like Cakewalk Sonar), communicate with Microsoft MME or Microsoft DirectSound drivers instead of communicating with the MARIAN drivers directly. The Microsoft drivers in turn communicate with the MARIAN WDM-Audio drivers.

For audio applications using these Microsoft drivers, the following applies:

- They can playback simultaneously using the same playback device. The Microsoft Kernel Mixer mixes the playback signals of the applications into one stereo stream and routes it to one physical output device. If playback takes place with different sample rates, the Microsoft Kernel Mixer converts the sample rate of the playback streams to the highest sample rate required.

Hint: You can improve the quality of this conversion! (See Control Panel | Sounds and Audio Devices | Audio | Sound Playback | Advanced | System Performance)

- The described simultaneous playback of different applications fails, if the output device is already in use by ASIO, GSIF, "Classic MME" or direct WDM-Audio.

- The number of the available recording and playback devices is limited:
  - on Windows 2000 to 10 devices each (20 channels)
  - on Windows XP to 32 devices each (64 channels)

- This limitation applies to the number of all audio devices installed in the system. You can use "Classic MME" or ASIO avoid this limitation.

- The minimum possible latency is limited to app. 30ms through the Microsoft Kernel Mixer architecture. Use ASIO or GSIF to avoid this limitation.

- Some audio applications show additional audio devices with their names appended by "(3+4)", "(5+6)" or "(7+8)". This is caused by an anomaly of the Microsoft MME/DirectSound system. Please ignore these devices and do not use them.

- The Microsoft DirectSound or the Microsoft MME devices do not work with the Driver Settings for Start/Stop Synchronization "Synchronous" and "SyncBus". Activate these settings only if you are sure that you work with ASIO, GSIF or "Classic MME" only! Otherwise, the entire Microsoft WDM-Audio System could freeze. This circumstance cannot be influenced by the driver.

  Attention: The Windows System Sounds are working with DirectSound or MME via WDM-Audio if you do not set a classic MME device as standard playback device!

- Some audio applications require the MARIAN driver because of its additional hardware support functions:

- Hardware Punch In Monitoring
- Hardware Pitch Support
- Hardware Audio Signal Routing
- Hardware Audio Signal Level Measurement

These functions are not supported by the Microsoft drivers. Please supply these audio applications with the "Classic MME" devices.

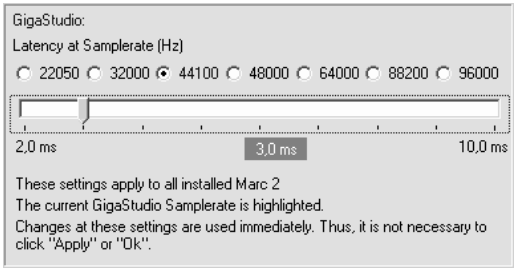
7.6.3.2 Section “Classic MME Drivers”

The MARIAN driver enables you to use the former MME driver interface, which was common until WDM-Audio was introduced, as an addition to all other driver interfaces. From now, we will call this interface "Classic MME". You can activate "Classic MME" within the MARC 2 Manager settings. If this driver interface is active, you get additional recording and playback devices in the appropriate device lists. These devices have the name suffix "(MME)".
The "Classic MME" devices have these advantages:

- The number of the recording and playback devices available is NOT limited (see above)
- These devices support the MARIAN hardware support functions (see above)
- These devices work much faster and have better latency values than the MME via WDM-Audio devices

These devices ensure correct start/stop synchronization. This is not possible with DirectSound or MME via WDM-Audio!

7.6.3.3 Section “GigaSampler/GigaStudio”



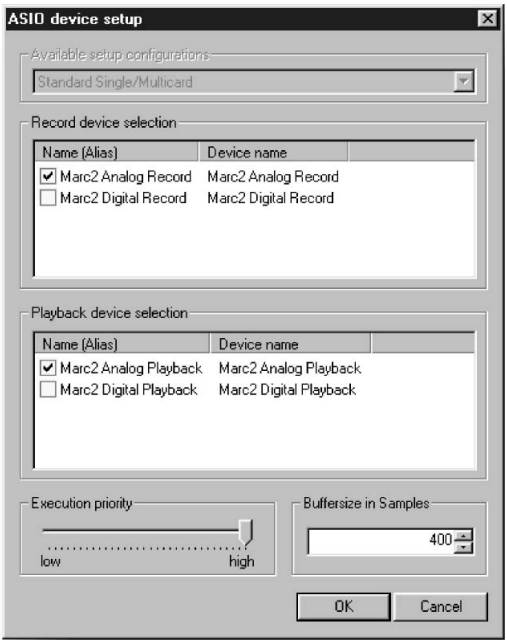
In section GigaSampler/GigaStudio you can setup the latency between a Tascam GigaStudio MIDI event and the resulting sound playback.

Move the latency slider right, to increase the latency value. Mode the latency slider left, to decrease the latency value.

You should increase the latency value only, if expirience drop outs during the GigaStudio playback. As a result of increasing the latency value, the GigaStudio playback becomes more stable.

The latency also depends on the playback sample rate. You can choose another sample rate to **show** the resulting latency value – this will not change the sample rate. The actual GigaStudio sample rate is shown in blue color.

8. ASIO Settings



The picture on the right shows the ASIO controls panel of the MARC 2 driver. You can open this panel within your ASIO application program. Please refer the manual of this program to learn where the ASIO control panel can be opened.

By enabling the checkboxes in front of the entries of the inputs and outputs you determine, which devices the ASIO application can 'see' and use.

You can change the listed "*Name (Alias)"* in the first column by double-clicking the entry. This way you can rename it as you like.

Hint: Only activate the playback and recording devices which you really want to use within you project! Each activated device reserves system resources and CPU load – even if you do not use the device in you audio project.

Should you use ASIO compatible audio software, you may have to perform additional settings in the ASIO configuration of the software. For details please refer to the software manual.

When enabling the digital recording device, please ensure that there is a valid signal at the chosen S/PDIF input. If this is not case, neither the recording nor the playback of any device will work.

The slider "*Execution priority"* determines in "*high"* position, that the transmission of ASIO data is given a high processor priority. In the position "*low"* it is given to real time calculation of Plug-Ins.

Every audio application uses buffers to transfer the audio data to and from the hardware. These buffers work like containers. During playback the application fills the container with the playback data and the driver empties this container. The size of the container determines the latency between a live event (like a midi event or live recording) and the resulting playback. The latency grows with the size of the buffer.

You can setup the buffer size in the field *"Buffersize in Samples"*. Here you can tell the driver how many samples should fit in the container. The resulting latency value, expressed as a time value like milliseconds, depends on the sample rate. Most ASIO audio applications show this value when you close the ASIO setup dialog of the driver.

9. Software Samplers and Synthesizers

Software samplers and synthesizers normally supply MIDI output devices for other audio applications which want to use the software sampler as an instrument. If such an application starts, then normally this application opens the MIDI output devices and this in turn causes the software sampler to initialize its audio engine with the configured audio outputs.

This occurs even if you have NOT started the software sampler application.

In this situation the software sampler and the other audio application may conflict, if they use the same audio output. If you use other driver interfaces than Microsoft MME or DirectSound, you can use the MARC 2 with different audio applications at the same time but never the same output device simultaneously.

Therefore this hint:

First start the software sampler/synthesizer and setup an audio output device which will NOT be used by the other audio application. Start the audio application (sequencer) afterwards.

- Hint: If you start an ASIO or GSIF application for the first time, then it will use the device "MARC 2 Analog 1-2" for recording and playback.

The Windows Multimedia System also supplies a software synthesizer called "Microsoft GS Wavetable SW Synth". This synthesizer also has a MIDI output port with the same name. Since there is no explicit setup for the output device, the "Microsoft GS Wavetable SW Synth" always uses the standard playback device configured in "Control Panel | Sounds and Multimedia | Audio“. In the device setup you can see the window shown on the right.

10. Technical Data

- PCI Card 32-Bit 33 MHz, 5V
- 2 analog inputs (1/4” Stereo Jack)
- 2 analog outputs (1/4” Stereo Jack)
- 1 digital input S/PDIF (RCA)
- 1 digital output S/PDIF (RCA)
- 1 digital input S/PDIF (TOSLINK)
- 1 digital output S/PDIF (TOSLINK)
- Sample formats: 8, 16, 20, 24, 32 Bit Mono/Stereo
- Sample rates analog: 6 - 96 kHz +/- 15% Pitch
- Sample rates digital: 32 - 96 kHz +/- 15% Pitch
- Frequency response @ 44,1 kHz: 20 Hz - 20 kHz
- Frequency response @ 96 kHz: 20 Hz - 40 kHz
- Maximum analog input and output level: +8 dBu
- SNR AD: 104 dB(A)
- SNR DA: 110dB(A)
- THD+N AD @ -0,5 dbFS: 0,003%
- THD+N DA @ 0 dbFS: 0,002%

11. Service and Support

11.1 Warranty

Each Marc 2 leaving us is put under extensive functionality checks. We allow full 5 years of warranty. A copy of the receipt or bill serves as proof of purchase. If there is a deficiency occurring during the time of warranty, you can exchange the unit at your dealer. Damages originating in inappropriate handling or false operation are excluded from warranty.

You can still send the unit in to us for repair after the warranty has expired. You can decide to have it repaired, after receiving a calculation of the approximate repair costs. For this, please get in contact with our support service.

11.2 Contact

If you have any questions or problems when installing or operating the Marc 2, please proceed as follows:

1. Make sure, the newest driver is installed. The current driver files can be found on: *www.marian.de/en/downloads*
2. If still any questions remain, you can contact us via the internet using our support form at: *www.marian.de/en/support*
3. Or talk to us personally. Dial: *+49 341 589 32 22*

Interesting news, information as well as information about our products and authorized dealers can be found on www.marian.de.