

marian

MARC 4 DIGI

User's Guide

© March 2001, Marian.
Hardware Design by Marian
"SyncBus" developed by Marian
Manual by Wilke Pfannkuch - Hamburg

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Dear User,

thank you very much for your decision to purchase one of our products from the MARC product series. We wish you lots of success in working with our product.

Please consider taking 15 minutes to study this guide. Besides traditional installation and operation instructions it contains information that will make the handling with the MARC 4 DIGI and possibly the MARC Extender easier for you.

Your MARC 4 DIGI provides some special characteristics. In the following you will get a short overview:

- Support of 24 Bit and 96 kHz
- An integrated SyncBus
- Multi-client driver running on Windows for ASIO, GSIF, and MME
- Multiple Card Support (up to 4 cards can be used)
- DAT Marker Support
- Latency-free and flexible monitoring
- Using ASIO latency periods of 2 ms are possible

With the extension MARC Extender (not contained in the scope of supply - can be purchased as accessory at Media Assistance, telephone +49-7946-94 16 80) you are provided with the following characteristics:

- Wordclock synchronisation
- AES/EBU digital ports
- Electrical S/PDIF digital ports

1. Scope of Supply

First of all, please check, whether you received the following components undamaged and complete.

- MARC 4 DIGI PCI card
- User's Guide
- Driver CD-ROM

If you have purchased a MARC Extender, the following components are additional to the standard scope of supply:

- MARC Extender
- Extender cable
- AES/EBU break-out cable

2. System Requirements

In order to be able to operate the MARC 4 DIGI, your PC should meet the following requirements:

- AT compatible PC with a spare PCI slot
- for MARC Extender a spare case slot
- Pentium or AMD processor
- Windows 95/98/ME/NT4/2000

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

3. Hardware Installation

Following the described steps below you can install up to four MARC 4 DIGI cards on the same PC.

1. Turn off your PC and all devices connected to it, disconnect the power supply.
2. Open the case.
3. Remove all cards from the anti-static foil. Make sure to hold the MARC 4 DIGI only at its edges or the slot bracket. Do not touch the components of the cards.
4. Insert the card carefully and rectangular into a spare 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 you want to use the MARC Extender, please now perform the steps described in Chapter 3.1.***
7. ***If you use the SyncBus for multi-card operation, please read Chapter 5.3 before closing the case***
8. Close the PC case and reconnect it to the power supply.

3.1. Extender Installation

1. Remove the MARC Extender from the anti-static foil. Make sure to hold the card only at its edges or the slot bracket. Do not touch any of its components and contacts.
2. Insert the MARC Extender carefully into a spare case output. This output can also belong to an unused slot of the main board. Ensure that the extender was inserted properly.
3. Connect the MARC Extender with the MARC 4 Digi by using the provided flat cable. Please note the illustrations and hints in Chapter "Ports" on pages 7-8.
4. ***If you want to use Wordclock synchronisation please refer to chapter 5.4 first.***
5. Screw the MARC Extender on the slot bracket to the case.

4. Driver Installation

4.1. About MME, DirectX, ASIO and GSIF

For connecting software and hardware you can use the driver interfaces MME, DirectX or DirectSound, ASIO and the NemeSys GigaSampler Interface (GSIF). All these interfaces are provided by the MARC 4 DIGI driver after it is installed on Windows 95/98/ME. On Windows NT and Windows 2000 only MME is available. This way you can use MARC 4 DIGI with all common audio applications. If you use an 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!

For the MARC Extender no additional driver installation is necessary. The MARC 4 DIGI driver contains all necessary components and detects the MARC Extender automatically.

4.2. 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 *\\marc4d\win9x\english* directory and confirm your selection. Windows copies the driver files and installs MARC 4 DIGI.
7. After finishing the installation, your MARC 4 DIGI is ready to be operated without having to restart the system.

4.3. 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 `\\marc4d\\win9x\\english` directory on the CD and confirm it by clicking the *"OK"* button.
6. Windows copies the driver files and installs the MARC 4 DIGI. 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 4 DIGI is ready to be operated without having to restart the system.

4.4. 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 `\\marc4d\\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 4 DIGI.
8. After finishing the installation click *"Finish"*. The driver will be enabled and the MARC 4 DIGI is ready to be operated without having to restart the system.

4.5. 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 "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 `\marc4d\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 4 DIGI is available without having to restart the system.

5. Ports

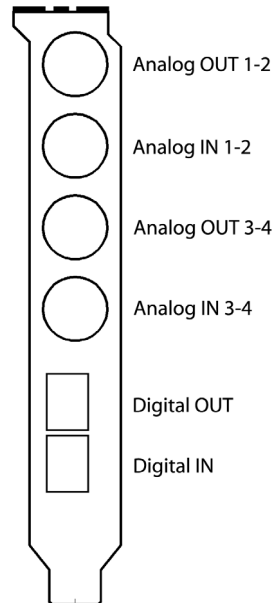
5.1. External Audio Ports

The picture on the right shows the slot bracket of your MARC 4 DIGI with its external audio ports.

For using the analog ports you require 4 shielded cables, which are equipped with a 1/4" TRS plug at the MARC side end. The plug and/or plugs at the other cable end depend/s on the ports of the device, which are to be connected.

If you want to use optical digital ports you require optical cables, which you can purchase at your authorised dealer.

When using optical cables, please ensure that they are free of breaks and damage, because this may lead to failures.

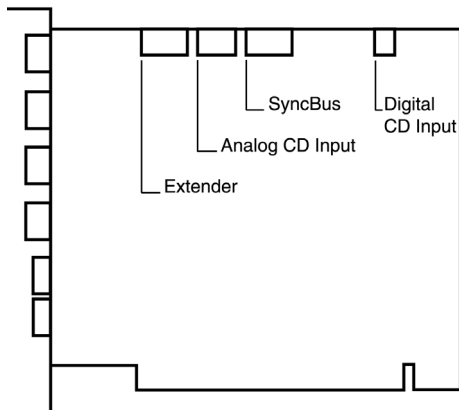


5.2. Internal Ports

The picture on the right shows the board of the MARC 4 DIGI with its internal ports.

For the processing of audio signals of your CD-ROM drive you can either use an analog input or an electrical digital input.

For information which kind of ports your CD-ROM drive provides, please refer to the appropriate manual.



5.3. SyncBus Connector

If you use several MARC cards or other soundcards developed by Marian, such as Siena, Prodif 96 PRO or Prodif Plus, you connect the SyncBus ports of the individual cards using a cable which is available as accessory. You can purchase a SyncBus cable from Media Assistance, telephone +49 7946 94 16 80.

The SyncBus of your MARC 4 DIGI has two jobs: on one side it synchronizes the digital clock and ensures that several cards run synchronously when they are operated parallel. 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 sense means either cards with SyncBus or even inputs and outputs of one and the same card.

For details on the settings see chapter 6.4.1.

5.4. Extender

The pictures on the right show the slot bracket and the MARC Extender's board.

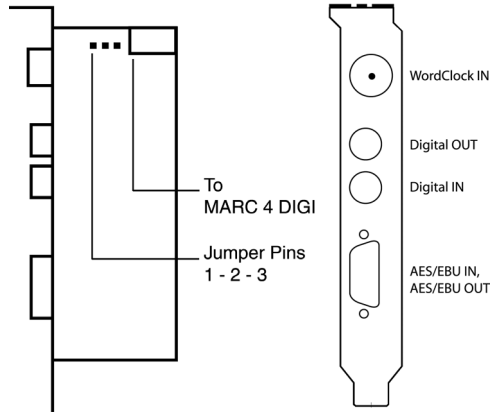
Using the Wordclock input you can implement the bond consisting of MARC 4 DIGI and MARC Extender in a Wordclock environment. If the extender is connected at the end of the Wordclock bus, the

Wordclock input of the extender will have to be terminated. This is ensured by setting the jumper on the pins 2 to 3 of the jumper block. If a termination of the Wordclock is not required, you will have to set the jumper on the pins 1 to 2 of the jumper block.

For details concerning the synchronisation settings, please refer to chapter 6.4.1.

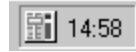
For the connection of external digital devices with electrical S/PDIF inputs and outputs you can use commercially available RCA cables.

For the connection of external digital devices with AES/EBU inputs and outputs you will have to plug the supplied break-out cable on the 9-pin SUB-D connector. This one will provide you with an XLR socket and an XLR plug, which you use for connecting your AES/EBU device.



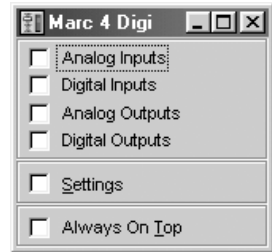
6. MARC 4 DIGI-Manager

After successful driver installation the symbol shown on the right appears for the MARC-Manager in the Windows taskbar.

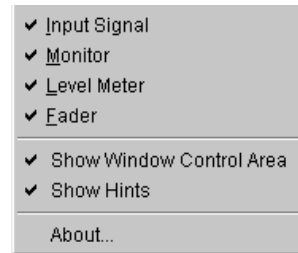


You open the MARC-Manager by double-clicking the taskbar symbol. The dialog box is displayed on the right.

By enabling the checkboxes "*Analog Inputs*", "*Digital Inputs*", "*Analog Outputs*", "*Digital Outputs*", and "*Settings*" further windows are opened, in which you can read and change the appropriate settings. By enabling the checkbox "*Always on Top*" you can always see the opened windows on top of all other application windows.



In the "*Analog Inputs*", "*Digital Inputs*", "*Analog Outputs*" and "*Digital Outputs*" windows you have two possibilities to change the section view of these windows and hide or unhide the desired section. You can either use the lowest section with the checkboxes "*Input Signal*" or "*Output Signal*", "*Monitor*", "*Level Meter*", "*Fader*", and "*Format*", or you right-click the title bar of the window and enable or disable the hooks in front of the section titles as shown on the right.



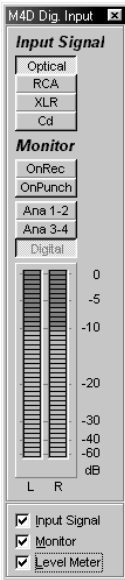
You can hide the section with the checkboxes for the window control by using the "*Show Window Control Area*" function.

6.1. Analog and Digital Inputs

The settings window for the analog and digital inputs is divided from the top to the bottom into the sections "Input Signal", "Monitor" and "Level Meter".

For analog inputs you can further see the "Fader" section. Using faders you can adjust the input level by -40 to $+18$ dB.

In the "Input Signal" section you determine from which input the audio signal is processed. For the analog inputs 3-4 you can additionally to the external audio ports ("Line") choose the analog internal CD-ROM input using "CD".



For digital input you can choose between the digital internal CD-ROM input ("CD") and "Optical".

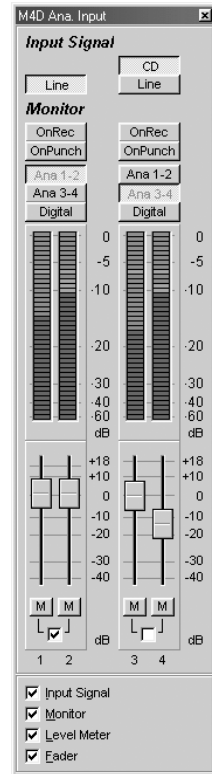
"XLR" and "RCA" are additionally provided only for connected extenders.

In the "Monitor" section you determine a situation-dependent automatic monitoring. For details please refer to chapter 6.3.

The level meters show the level of the signals present at the input between -60 and 0 dB.

The "M" button below the faders is a mute button. It turns off the audio signal on the appropriate channel.

The checkbox in the middle below these buttons groups the faders of the individual channels to stereo groups.



6.2. Analog and Digital Outputs

The settings window for the analog outputs is divided from the top to the bottom into the "Output Signal", "Level Meter" and "Fader" sections.

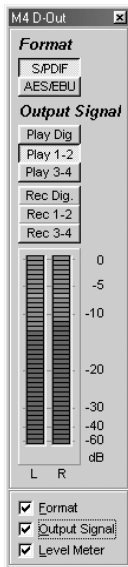
In the "Output Signal" section you determine, which source signal is played on the output independently from the situation-dependent monitor settings. For details please refer to chapter 6.3.

The level meters show the level of the determined source signal.

Using the faders you have the possibility to reduce the output level by up to -60 dB. This has no effect on the source signal level shown by the level meters.

The "M" button below the faders turns off the audio signal on the appropriate channel.

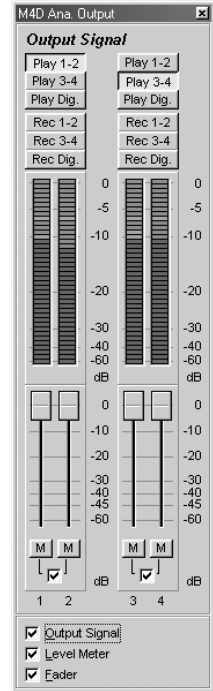
The checkbox in the middle below these buttons groups the faders of the individual channels to stereo groups.



The settings window for the digital outputs is divided from the top to the bottom into the "Format", "Output Signal" and "Level Meter" sections.

Beside the sections of the analog outputs window, you may perform additional settings for the digital output. In the "Format" section you determine whether the output signal will be an AES/EBU or S/PDIF signal.

If you use the MARC Extender together with the MARC 4 DIGI, the AES/EBU output and the S/PDIF RCA output of the extender always carries the same signal like the optical output of the MARC 4 DIGI.



6.3. Monitor Settings

The three pictures on the right show possible settings in the input windows for situation-dependent monitoring.



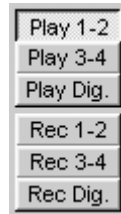
"OnRec"

means, that the signal at the input of the MARC 4 DIGI is switched to the chosen output only during recording. This way you can check the signal during recording.

"On Punch"

means, that the signal at the input of the MARC 4 DIGI is switched over to the output during the period of a punch recording. For this the audio software needs to provide the PunchIn and PunchOut command for the driver.

The two pictures on the right show examples for the monitor setting in the output windows.



"Play"

means that you can hear the playback signal of the audio software at the output of the MARC 4 which uses one of the determined playback devices of the MARC 4 DIGI. This way *"Play 1-2"* in this window equals the *"MARC 4 DIGI Analog Playback 1-2"* setting in the audio software.

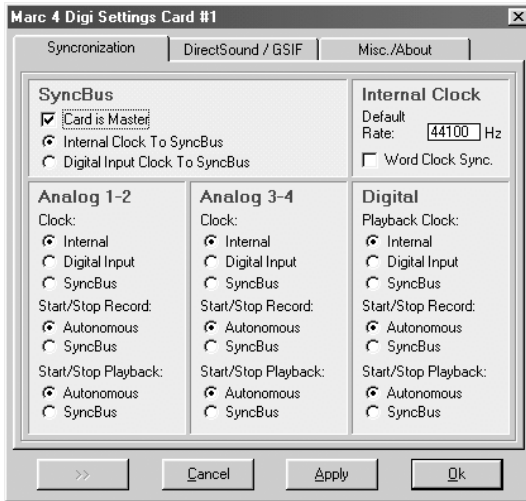
"Rec"

means that you can hear the signal of the selected input at the output of the MARC 4.

All these monitor settings are independent from the used audio software and their settings. Please note that the monitor capabilities may limit in dependence on clock settings and number and kind of enabled inputs.

6.4. Driver Settings

6.4.1. "Synchronisation" Tab



In this window you perform synchronisation settings for the MARC 4 DIGI.

6.4.1.1. "SyncBus" Section

"Card is Master"

means that the MARC 4 DIGI provides the clock for the SyncBus, which is responsible for the record and playback sample rate, and consequently synchronises other cards.

If several cards are to be synchronised using the SyncBus, exactly one card has to be configured as master. All other cards have to be configured as slave.

"Internal Clock To SyncBus"

means, that the MARC 4 DIGI transfers the clock signal produced on the card to the SyncBus.

"Digital Input Clock To SyncBus"

means, that the clock of a device connected to the digital input is transferred to the SyncBus.

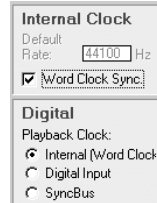
6.4.1.2. "Internal Clock" Section

"Default Rate"

This input field contains the frequency at which the internal clock works provided no device of the card is used by the application. If the card is configured as master in the SyncBus operation you determine here the sample rate, which is used by the slave cards as reference provided no device is used by the master card.

"Word Clock Sync."

If you enable this checkbox the MARC 4 DIGI synchronises the internal clock to an externally connected Wordclock and operates as slave. All devices which were synchronised to the internal clock before, then depend on the external Wordclock. The label changes accordingly from "Internal" to "Internal (Wordclock)".



The "Wordclock Sync" option is only provided for connected extenders.

6.4.1.3. "Analog 1-2", "Analog 3-4", and "Digital" Sections

Here you can perform separate synchronisation settings for the according inputs and outputs.

"Internal", "Digital Input" and "SyncBus" are available as clock sources.

In the chapters "Start/Stop Recording" and "Start/Stop Playback" the following applies:

"Autonomous"

means, that the device does not evaluate any signals on the SyncBus. It runs in independent operation.

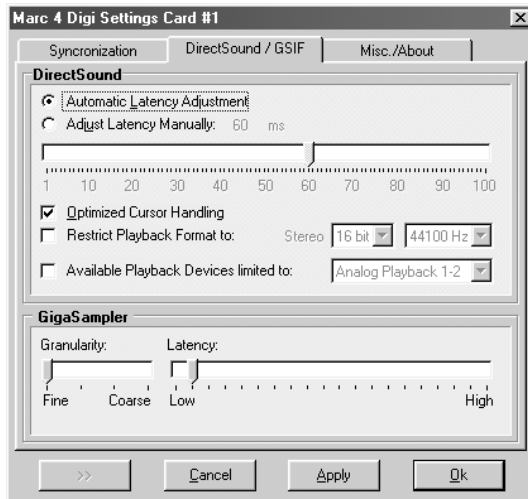
This setting is especially of use, if several audio applications have to access independently different inputs and outputs.

"SyncBus"

means, that the device evaluates the signals on the SyncBus and synchronises.

Please note, that for some synchronisation settings the monitor settings of the driver may be reset.

6.4.2. "DirectSound / GSIF" Tab



In this tab you determine the settings for applications which use DirectSound or NemeSys GigaSampler Interface (GSIF) as driver interface.

6.4.2.1. "DirectSound" Section

In this section you determine the settings for applications, which use DirectSound as driver interface.

Here are some information in advance: the ideal settings for the DirectSound usage depend on some factors in your PC. Because of this we cannot recommend any ideal settings, but can only provide you some information on what's behind the possibilities for the settings. You will have to test yourself, what settings will suit best. Anyway, using the standard settings will ensure a trouble-free operation.

"Adjust Latency Manually"

Moving the latency control slider changes the size of the audio buffer on the card. If the settings for the latency period is too low, it may result in interruptions. In this case you will have to increase the latency period.

"Restrict playback format to:"

When using certain audio programs with DirectSound it may happen, that the DirectX system attempts to open the driver using a different sample format, than the audio programs intends to use. This results in a real time conversion of the signal format by the DirectX system. This conversion may have negative influence on the sound and system performance.

If a playback using DirectSound does not sound correct, you will have to set the signal format, which you use in the audio software. This way the DirectX system is forced to exclusively open the driver using the set format in the MARC Manager and the real time conversion is inapplicable.

"Available Playback Devices limited to:"

Here you adjust the (stereo) output for DirectSound applications, which have no selection of the output. The output of the audio signals is then restricted to this (stereo) output.

6.4.2.2. "GigaSampler" Section

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 playback disturbances (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 playback disturbances easier.

For ideal results try to set the values of the two faders as low as possible.

6.4.3. "Misc. / About" Tab



"Disable messages about samplerate conflicts" and "Disable messages about device conflicts"

Here we provide you with the possibility to display error messages of clock and sample rate problems as well as device problems. By standard the display of error messages is suppressed.

We recommend to enable the display only when you meet problems during the start of the recording or playback, or your audio software outputs error messages which refer to unknown external errors.

7. ASIO Settings

In the device control of the ASIO application you can see the windows shown on the right.

By enabling the checkboxes in front of the entries of the inputs and outputs you can determine which devices can be "seen" and be used by the ASIO application.

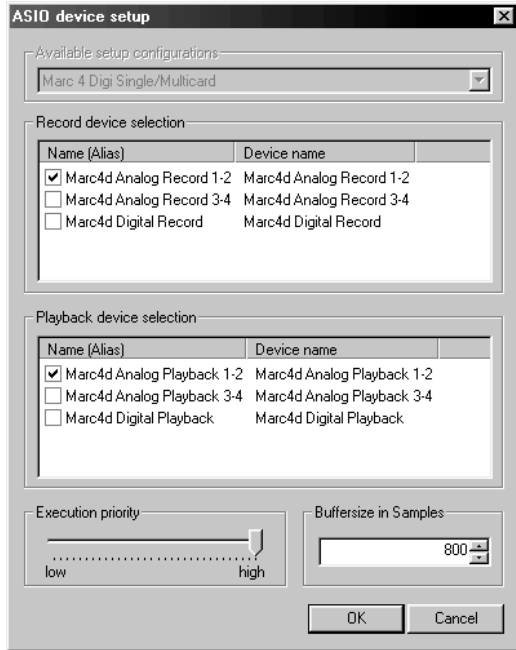
The ASIO application can see the devices in the first "Names (Aliases)" column. These names you can rename as desired.

The "Execution Priority" slider

determines in "high" position, that the transmission of ASIO data is given a higher processor priority, in the position "low" it is given the real time calculation of PlugIns.

If you activate the device "Marc4d Digital Record" it is essential that the digital input gets a valid digital signal from an external digital device. The clock of this digital signal will be used as reference clock for the whole ASIO setup. If there is no clock neither record nor playback of any device will work.

Should you use an 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.



8. Technical Data

- 4 analog input (1/4" TRS jacks)
- 4 analog output (1/4" TRS jacks)
- 1 digital input S/PDIF (optical)
- 1 digital output S/PDIF (optical)
- Sample formats: 8, 16, 20, 24, 32 Bit mono/stereo
- Sample rates, analog: 6–112 kHz
- Sample rates, digital: 32, 44.1, 48, 64, 88.2, 96 kHz +/- 10% pitch
- Frequency response @ 44.1 kHz: 20 Hz to 20 kHz
- Frequency response @ 96 kHz: 20 Hz to 40 kHz
- Maximum input and output level: +8 dBu
- Signal-to-noise ratio AD: 104 dB(A)
- Signal-to-noise ratio DA: 114 dB(A)
- Total Harmonic Distortion: 0.005%

Extender:

- 1 digital input S/PDIF (electrical)
- 1 digital output S/PDIF (electrical)
- 1 digital input AES/EBU
- 1 digital output AES/EBU
- 1 Wordclock input

9. Service and Support

Should you have any questions or problems during the installation or operation of your MARC 4 DIGI please perform the following steps:

1. Ensure that you always have the latest driver installed. You find the current driver files on the following internet page:
<http://www.marian.de/english/downloads.htm>
2. Have a look in our Audio Guide, which has been published on the internet, whether you can find a solution to your problem or an answer to your question. Here you also find the *Audio Guide*:
<http://www.marian.de>
3. If any questions still remain, you can contact us via e-mail. Please write to:
support@marian.de
or give us a phone call:
+49 341 5893222.

Interesting news, information and driver updates you can find here:
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