

Hi-Speed
XILINX 4006
on Board!

User's Guide



DIGI32/8

Hi Performance

PCI-Bus Audio Card
2 / 8 Channels Stereo / ADAT[®] Interface
24 Bit / 48 kHz Digital Audio
32-48 kHz Sample Rate

Contents

1	Introduction	3
2	Package Contents	3
3	System Requirements	3
4	Brief Description and Characteristics	3
5	Technical Specifications	
5.1	Digital.....	4
5.2	Digital Interface.....	4
5.3	Transfer Modes: Resolution/Bits per Sample.....	4
6	Hardware Installation	5
7	Software Installation	
7.1	Windows 9x.....	5
7.2	Windows NT.....	5
7.3	Windows 2000/XP.....	6
7.4	Driver Deinstallation	6
7.5	Linux/Unix.....	6
8	Operation and Usage	
8.1	External Connectors.....	7
8.2	Internal Connectors	7
8.3	Playback (Windows MME).....	8
8.4	Recording Digital (Windows MME)	9
8.5	Record while Play.....	9
9	Configuring the DIGI 32	
9.1	General	10
9.2	Force Adat.....	11
9.3	Windows 9x.....	11
9.4	Clock Modes - Synchronization.....	12
10	Using more than one DIGI 32	12
11	Special Features of the Digital Output	13
12	Notes on the ADAT Interface	14
13	Multiclient Operation	14
14	Hotline – Troubleshooting	
14.1	General.....	15
14.2	Installation.....	16
15	DIGICheck	17
16	TECH INFO	17
17	Warranty	18
18	Appendix	18

1. Introduction

DIGI32/8 allows the recording of digital audio from CD, DAT, sampler or other digital sources directly into your computer. The installation is made very simple, even for the inexperienced user, thanks to the most up to date Plug & Play technology. The support of up to 24 bit audio resolution and direct Hi-Speed 32 bit data transfer puts DIGI32/8 at the top of the range of interface cards available to date. Drivers for Windows 95, 98, NT, 2000 and XP allow a problem-free, comfortable and powerful usage on computer systems with PCI bus technology.

Our Hi-Performance philosophy guarantees full system performance in all possible functions not carried out by the driver (and therefore from the computer's CPU) but carried out by the DIGI32 hardware.

2. Package Contents

Please ensure that all the following parts are included in DIGI32/8's packaging box:

- PCI Card DIGI32/8
- Quick Info guide
- RME Driver CD
- Optical cable (TOSLINK)
- Internal cable (2 wire)

3. System Requirements

- Windows 95/98/ME/NT/2000/XP
- A free PCI bus slot

Additional system requirements such as CPU, memory etc. depend on the software used for recording, playing and editing the audio data.

4. Brief Description and Characteristics

- Short, full Plug & Play compatible PCI card
- 16 / 20 / 24 bit audio resolution
- Display of the input sample frequency and ADAT input status
- Outputs optical / cinch work simultaneous (signal distribution possible)
- Accepts Professional and Consumer Format
- Ignores copy protection
- Ground free transformer coupled inputs and outputs
- Error LED for input signal
- Low Jitter Design: < 3 ns in PLL mode (44.1 kHz, optical In)
- Sample aligned simultaneous start of record and playback in Record while Play mode
- 32 bit memory transfer guarantees low system load
- No DMA or input / output address needed
- Full Duplex (simultaneous recording and playback)
- Monitoring (pass through mode for input signal)
- High bus transfer rate (> 120 MByte/s) ensures minimal CPU / system load
- More than one card with only one driver useable (Windows)
- Automatic hardware self-test when booting

5. Technical Specifications

5.1 Digital

- Low Jitter Design: < 3 ns in PLL mode (44.1 kHz, optical input)
- Supported sample rates: 32 kHz, 44.1 kHz, 48 kHz, 25 kHz-60 kHz via AutoSync
- High sensitive input stage (< 0.2V_{ss} input level)
- Input PLL ensures zero dropout, even at more than 40 ns jitter
- Output voltage Consumer 0.8 V, Professional 1.6 V
- Supports all known formats mono/stereo from 16 to 24 bit

5.2 Digital Interface

- Inputs and outputs ground-free transformer coupled
- Connectors: optical (TOSLINK), coaxial (phono), internal (CD-ROM/Sync-In, Sync-Out)
- Formats: SPDIF, AES/EBU (Consumer/Professional), ADAT optical

5.3 Transfer Modes: Resolution / Bits per Sample

- 16 bit 2 bytes (stereo 4 bytes) (*)
- 20 bit 3 bytes MSB (stereo 6 bytes)
- 20 bit 4 bytes MSB (stereo 8 bytes) (*)
- 24 bit 3 bytes (stereo 6 bytes)
- 24 bit 4 bytes MSB (stereo 8 bytes) (*)
- 32 bit 4 bytes (stereo 8 bytes) (*)

All the above formats are also available in Multi-Device mode (4 x stereo = 8 channels). The Channel Interleave mode (1 x 8) provides the following resolutions:

- 16 bit 16 bytes (*)
- 24 bit 24 bytes
- 24 bit 32 bytes (*)

* The indicated modes are directly supported by the hardware and therefore work in 32 bit hi-speed transfer mode. The other modes (so called 'packed byte' formats) are queued up to 32 bit data packets by special copy routines in the driver. These routines are written in Assembler, causing no measurable system load. The supported modes with other Operating Systems than Windows depend on the OS and/or the corresponding drivers.

6. Hardware Installation



Important: Switch off the computer and remove the power cable from the power supply before fitting the DIGI32/8. Inserting and removing the card while the computer is in operation will more than likely lead to irreparable damage to the mainboard!

1. Disconnect the power cord and all other cables from the computer
2. Remove the computer's housing; further information on how to do this can be obtained from your computer's instruction manual
3. Important: Before removing the DIGI32/8 from its protective bag, discharge any static in your body by touching the metal chassis of the PC.
4. Insert DIGI32/8 firmly into a free PCI slot, press and fasten the screw.
5. Replace the computer's housing and tighten the screws.
6. Reconnect the power cable and all other cables/connections.

7. Software Installation

7.1 Windows 95/98/SE/ME

After the hardware has been installed correctly (see 6. Hardware Installation), and the computer has been switched on, Windows will recognize the new hardware component and start its 'Add New Hardware Wizard'. Insert the RME Driver CD into your CD-ROM drive, and follow further instructions which appear on your computer screen. The driver files are located in the directory **VDIGI32** on the RME Driver CD.

Windows will install the DIGI driver, and will register the card in the system as a new audio device. The computer should now be re-booted.



Unfortunately, in seldom cases, the path to the CD-ROM (i.e. its drive-letter) has to be typed in again during the copy process.

All cards of the DIGI32 series are configured through a Settings dialog, found in Windows Device Manager. See chapter 9 for details.

7.2 Windows NT

As automatic hardware recognition has not been implemented in Windows NT 4.0 the drivers have to be installed 'by hand'.

After the hardware has been installed correctly (see 6. Hardware Installation) and Windows NT has been booted, insert the RME Driver CD into your CD-ROM drive. Register the new device by starting `>Control Panel /Multimedia /Devices /Audio Devices /Add<`. Change to the CD's directory to **INT** in the CD-ROM. Windows NT will now install the driver. The RME Settings dialog will open automatically.

A click on 'OK' finishes the installation. After a reboot the DIGI symbol will show up in the systray of the taskbar. The DIGITray tool will be loaded automatically each time when booting NT.

A left mouse click on the DIGI symbol starts the 'Settings' dialog. The NT driver supports any combination of up to three RME cards. The driver is installed only once for all cards in the system.

7.3 Windows 2000/XP

After the hardware has been installed correctly (see 6. Hardware Installation), and the computer has been switched on, Windows will recognize the new hardware component and start its 'Hardware Wizard'. Insert the RME Driver CD into your CD-ROM drive, and follow further instructions which appear on your computer screen. The driver files are located in the directory **\\DIGI96 W2k** (no error!) on the RME Driver CD.

Windows will install the DIGI32 driver, and will register the card in the system as a new audio device. The computer must be rebooted then.

All cards of the DIGI32 series can be easily configured using the RME DIGI Settings dialog. The panel 'Settings' can be opened

- by clicking on the DIGI icon in the Taskbar's system tray



In case the warning messages 'Digital signature not found', 'Do not install driver', 'not certified driver' or similar come up: Don't listen to Microsoft, listen to us and continue with the installation.

7.4 Deinstalling the Drivers

A deinstallation of the DIGI32 series driver files is not necessary – and not supported by Windows anyway. Thanks to full Plug & Play support, the driver files will not be loaded after the hardware has been removed. If desired these files can then be deleted manually.

Unfortunately Windows Plug & Play methods do not cover the additional autorun entries of the Settings dialog, and the registering of the ASIO driver. Those entries can be removed from the registry through a software deinstallation request. This request can be found (like all deinstallation entries) in *Control Panel, Software*. Click on the entry 'DIGI96 Link and Tray Autostart', or 'RME DIGI32, DIGI96 and Hammerfall Series'.

7.5 Linux/Unix

Drivers for Linux, Unix and Solaris are available at 4Front Technology. Information:
<http://www.opensound.com>

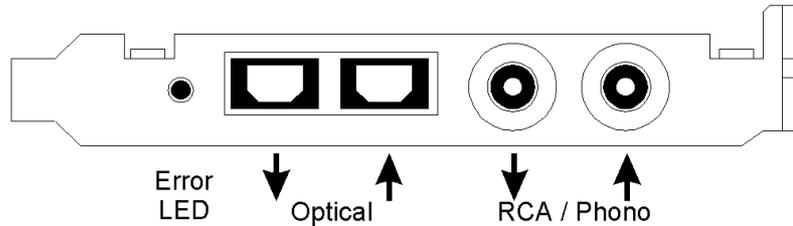
Another source of (free) drivers may be the ALSA project:
<http://www.alsa-project.org>

8. Operation and Usage

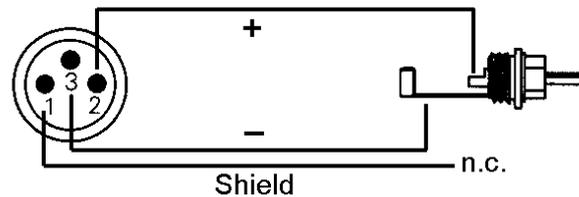
8.1 External Connectors

The DIGI32/8 has 2 external inputs and outputs. The current input is activated through 'Settings', available by a click on the DIGI symbol in the Taskbar's system tray (under Win9x through >Device Manager /DIGI328 /Properties /Settings<). The card accepts all commonly used digital sources, SPDIF and AES/EBU as well as ADAT optical. Channel status and copy protection are ignored.

All outputs are driven in parallel, therefore carrying identical signals. In the simplest situation, connect 2 devices at the outputs and use the card as a splitter (distribution 1 to 2).



To receive signals in AES/EBU format, an adapter cable is required. Pins 2 and 3 of a female XLR plug are connected individually to the two pins of a phono plug. The cable shielding is only connected to pin 1 of the XLR - not to the phono plug. The ground-free design, with transformers for digital inputs and outputs, offers a trouble-free connection of all devices along with perfect hum rejection.



8.2 Internal Connectors

The DIGI32/8 has one internal digital input and output, provided by 2-pin connectors on the board. The internal input ST3, labelled **CD IN / Sync In**, can be connected to an internal CD-ROM drive having a digital audio output (advantage: the built in CD-ROM drive is sufficient for digital recording and the need for external cabling does not arise). Or it can be connected with the internal output of another DIGI32 series card (synchronizing multiple cards).

The internal output ST4, labelled **Sync Out**, provides a copy of the current external output signal. An internal loopback proves to be a useful application. Use the supplied two pin cable to connect Sync In and Sync Out, set the card to Clock Mode 'Master' and selectal 'Internal' as input. Now the output signal shows up directly at the card's input. This allows you to record the playback signal, or to display the playback signals with our **DIGICheck** software.

8.3 Playback (Windows MME)

DIGI32/8 can play back audio data only in supported formats (sample rate, bit resolution). Otherwise an error message appears (for example at 22 kHz and 8 bit).

In the audio application being used, DIGI32/8 must be selected as the output device. This can often be found in the *Options*, *Preferences* or *Settings* menus under *Playback Device*, *Audio Devices*, *Audio* etc. Only a few programs exclusively use Windows' *Preferred Playback Device*. This setting can be changed in >Control Panel /Multimedia /Audio<. We recommend using 24-bit resolution for playback to use the DIGI32 series fullest potential.

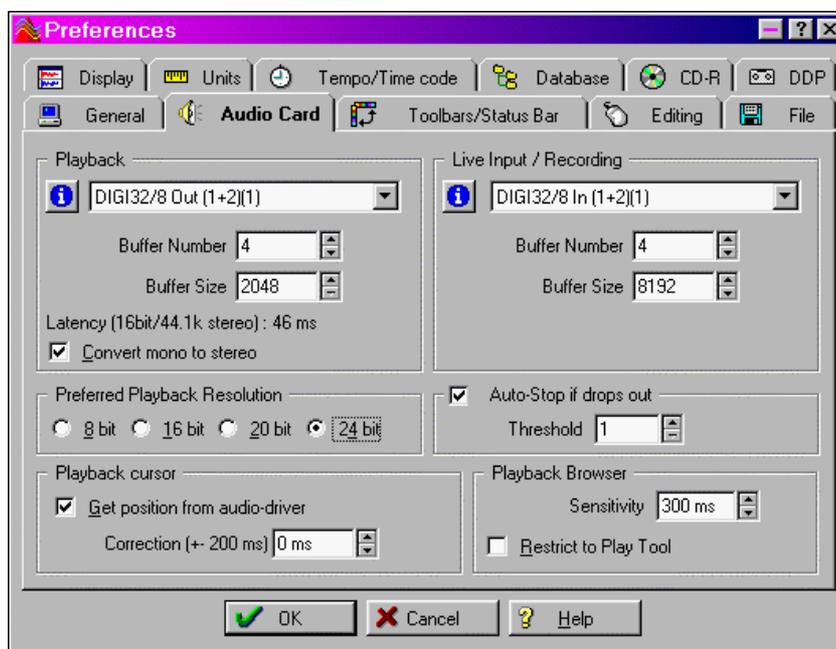
We strongly recommend switching all system sounds off (via >Control Panel /Sounds<). Also DIGI32/8 should not be the *Preferred Device* for playback, as this could cause loss of synchronization and unwanted noises. If you feel you cannot do without system sounds, you should consider buying a cheap Blaster clone and select this as *Preferred Device* in >Control Panel /Multimedia /Audio<.

The RME Driver CD includes step by step instructions for configuring many popular audio applications. Start setup.htm or setup2.htm (in the `\\rmeaudio.web\techinfo\` directory).

The picture to the right shows the smallest buffer setting for a crackle-free 24 bit operation in a computer with 200 MHz.

More or larger buffers produce an even higher defence against disturbance, but also cause a longer delay in playing back the data. In case of synchronized audio to MIDI playback be sure to activate the checkbox 'Get play position from audio driver' when available in your program.

Because the DIGI32/8 reports the actual play position correct (even in record where this is necessary for chase lock sync) there will be no sync problems when working in a mixed audio/MIDI environment even with higher buffer settings.



8.4 Recording Digital (Windows MME)

Unlike analog soundcards, which produce empty wave files (or noise) when no input signal is present, digital I/O cards always need a valid input signal to start recording (this includes the correct sample frequency as well).

To take this into account, RME has included three unique features in the DIGI32 series: an error LED for the active digital input in use, a comprehensive I/O signal status display (showing sample frequency, lock and format) in the Settings dialog, and the protective *Check Input* function.

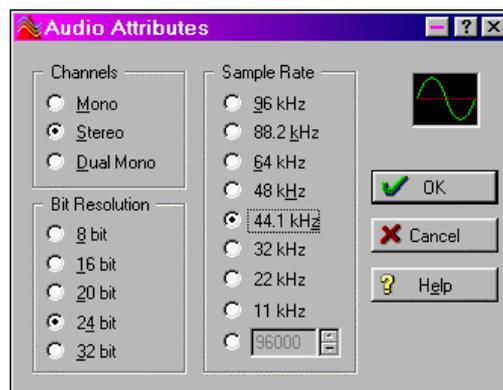
The error LED indicates whether the card gets power and a valid digital input signal. Whenever an error occurs (wrong input, invalid data, signal transmitting device delivers nothing), the LED will light red. As soon as a valid input signal is present the LED will turn off. The display of the sample frequency (see chapter 9, picture Settings) in the Status display offers a similar function. If no sample frequency can be recognized 'Out Of Range' will be shown, in case of an error detection 'No Lock'.

If a 48 kHz signal is fed to the input and the application is set to 44.1 kHz, *Check Input* stops the system from recording. This prevents faulty takes, which often go unnoticed until later on in the production. Such tracks appear to have the wrong playback rate - the audio quality as such is not affected. 'Check Input' may be switched off for vari-speed purposes.

Therefore configuring the software to perform a digital recording is child's play. After selecting the required input DIGI32/8 displays the current sample frequency. This parameter can then be changed in the application's audio attributes (or similar) dialog.

The screenshot to the right shows a typical dialog used for changing basic parameters such as sample frequency and resolution in an audio application.

Any bit resolution can be selected, providing it is supported by both the audio hardware and the software. Even if the input signal is 24 bit, the application can still be set to record at 16-bit resolution. The lower 8 bits (and therefore any signals about 96dB below maximum level) are lost entirely. On the other hand, there is nothing to gain from recording a 16-bit signal at 24-bit resolution - this would only waste precious space on the hard disk.



It often makes sense to monitor the input signal or send it directly to the output. The DIGI32 series includes a useful input monitor function, which can be set in the **RME DIGI Settings** (*Output/Automatic*). Activating Record or Pause in the application causes the input signal to be passed directly to the digital and analog output. However, some applications block monitoring by constantly activating playback, even if the played back track is empty. This is often required by programs to ensure that timing and punch I/O will work correctly.

8.5 Record while Play

DIGI32/8 allows the playback of audio data during the recording of further audio data, even at different sample frequencies. This feature, known as *Enhanced Full Duplex* or *Record while play*, is a must for multitrack harddisk recording, but it has to be supported by the recording software.

9. Configuring the DIGI32/8

9.1 General

The hardware of the DIGI32 series includes a number of helpful, well thought-of, practical functions and options, which allow you to configure the behaviour of the card to suit many different requirements. Through 'Settings' you will gain access to:

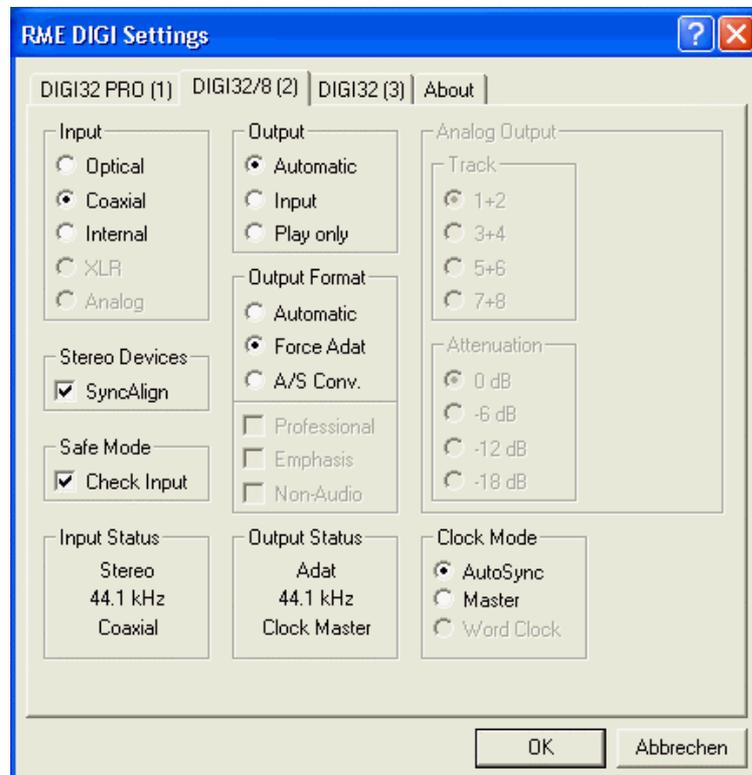
- Input selection
- Output operation
- Output Channel Status
- Synchronization behaviour
- Input and output status display

The display of the current input frequency and format is updated every 0.5 seconds. When choosing an input with a signal including errors or without any input signal the statement 'No Lock' appears, in vari-speed operation or with sample frequencies widely out of tune 'Out of Range' is shown. If the current signal has SPDIF or AES/EBU format then 'Stereo' is displayed. The changing / switching of the inputs happens right away and needs no further click on OK.

The three states of the output selected through the choicebox 'Output' control the monitoring behaviour of the card. 'Automatic' sets the normal mode where the input signal reaches the output only whilst recording. In this mode, when starting a recording, feedback occurs very often when using digital mixing desks. 'Play only' solves this problem by making sure that the input signal is never passed to the output.

After selecting 'Input', the input signal appears at the output whenever playback is not active. DIGI32/8 saves a continual record standby mode and can switch itself to monitoring without active software. As switching between the inputs is carried out in realtime, stepping through the inputs gives a fast check of the incoming signals.

Settings should not be changed during playback or record if it can be avoided, as this can cause unwanted noises. Also, please note that even in 'Stop' mode, several programs keep the recording and playback devices open, which means that any new settings might not be applied immediately.



Input

Defines the current input.

Stereo Devices (W2k only)

SyncAlign operates fully automated and should be kept active all the time. Only in case the stereo devices must operate completely independent, deactivating this setting may be necessary.

Safe Mode

Check Input verifies the current input signal against the settings in the record program. When de-activated a recording will always be allowed, even with non-valid input signals.

Output

With 'Automatic' active, the input signal reaches the output only whilst recording. 'Play only' prevents the input signal from being passed to the output. After selecting 'Input', the input signal appears at the output whenever playback is not active.

Output Format

Default: Consumer. Switches SPDIF into Professional mode. Specific information can be found in chapter 11.

Clock Mode

The card can be configured to use the selected input (AutoSync) or its internal clock (Master) as clock source.

Status Displays

The displays at the bottom of the dialog box give precise information about the current status of the card, like format of input and output signal, sample rate at input and output, or current clock mode.

9.2 Force Adat

The function 'Force Adat' forces the digital output into ADAT mode (i.e. 8-channel operation). When using a 'normal' 2-track program to play a stereo file, you're not only able to send the data to any SPDIF device, but also to any other ADAT interface! Just activate 'Force Adat' and choose the stereo pair that corresponds to the channels you want the data being transferred to (for example DIGI32/8 (3+4)).

When 'Force Adat' is activated, more than one 2-channel (stereo) program can access the ADAT interface simultaneously (see chapter 12).

9.3 Windows 9x

DIGI32/8 uses the Device Manager for configuration. Unfortunately accessing the DIGI32/8 inside the Device Manager is not as simple as it could be. To shorten the laborious way to the tab Settings a link is copied to the desktop (*C:\Windows\Desktop*), its icon to *C:\Windows*. Using the shortcut Ctrl-Num2 (the number 2 on the number block) or a double click on the DIGI symbol lets you jump straight to the Device Manager. From there it's only a few clicks to 'Settings'. If you need continuous access to 'Settings', simply don't close it. With Ctrl-2 'Settings' gets into the foreground at any time.

9.4 Clock Modes - Synchronization

In the digital world, all devices are either the 'Master' (clock source) or a 'Slave' synchronized to the master. Whenever several devices are linked within a system, there must always be a single master. The DIGI32 series includes a very user-friendly intelligent clock control, which handles the clock switching between master and slave on its own. Click on 'AutoSync' to activate this mode.

In AutoSync mode, the card constantly scans for a valid input signal at the active input. As soon as this matches the current playback sample rate, the card switches from the internal quartz (display 'Clock Master') to the clock generated from the input signal (display 'Clock Slave'). This allows on-the-fly recording, even during playback, without having to synchronize the card to the input signal first. It also allows immediate playback at any sample rate without having to reconfigure the card.

'AutoSync' guarantees a fault-free function of the modes Record, Record while Play and while using more than one card (see chapter 10). In certain cases however, e.g. when the inputs and outputs of a DAT machine are connected directly to the DIGI32/8, AutoSync causes feedback in the digital carrier, so synchronization breaks down. To remedy this, switch the card's clock mode over to 'Master'.

Thanks to the described AutoSync technology and a lightning fast PLL the DIGI32 series is not only capable of handling standard frequencies, but also any sample rate between 25 and 60 kHz. The digital input serves as synchronization source. Please note that at the start of a record or playback a valid sample frequency (32 kHz, 44.1 kHz, 48 kHz) has to be attached. When started, the sample frequency can be pitched to whatever is needed, DIGI32/8 will follow these changes immediately.



Only one device can be master in a digital system! When DIGI32/8 operates in clock mode 'Master', all other devices have to be 'Slave'.

More information on these subjects can be found in the HTML document 'sync.htm', located in the directory `\\rmeaudio.web\english\techinfo` on the RME Driver CD, or on our web site.

10. Using more than one DIGI32/8

All our drivers can communicate simultaneously with all the cards registered in the system. The driver marks them with different numbers after the device's name, like 'DIGI32/8 In (1)'.

Thanks to our AutoSync technology multiple cards can be synchronized easily by applying one input signal to all inputs simultaneously.



In order to connect more than one DIGI32/8 to a digital mixing desk they must all get the same clock(ed input signal). This is easy to achieve: just connect at least one input of each card to one output of the mixing desk.

Example 1: All DIGI's digital inputs are connected to other devices synced to the word clock net.

Activate the corresponding input of each card in its Settings dialog, and activate the mode AutoSync at all cards.

Example 2: Only the outputs of the DIGIs are connected to other devices.

Connect the internal Sync-Out of the master card to the Sync-In (CD-ROM) of the second card, activate its internal input and AutoSync mode. Next connect the third card in the same way, from the second's card Sync-Out to the third's card Sync-In. Configure this card like the second one. The necessary 2-wire cables are the ones supplied with the DIGI cards. Of course this method is also operational with the external connectors, like optical or coaxial, as long as the corresponding input is activated.



Please note when using more than one card plus the word clock output that only one card can be master!

More information on this subject can be found in the HTML document 'sync.htm', located in the directory `\rmeaudio.web\english\techinfo` on the RME Driver CD, or on our web site.

11. Special Features of the Digital Output

Apart from the audio data itself, digital audio signals in SPDIF or AES/EBU format include a header containing Channel Status information. False Channel Status is a common cause of malfunction. The DIGI32 series ignores the received header and creates a totally new one for the output signal.



Note that in record or monitor modes, set emphasis bits will disappear. Recordings originally done with emphasis should always be played back with the emphasis bit set!

Emphasis is used very seldom. In case you have to work often with such material we recommend our DIGI32 PRO. It allows to set emphasis active on the outgoing data while listening to the result of this operation.

The outgoing status data of the DIGI32/8 has, with regard to other digital appliances, been optimized to the largest compatibility possible:

- 32 kHz, 44.1 kHz, 48 kHz according to the sample frequency
- Audio use
- No copyright, copy permitted
- Format Consumer or Professional
- Category General, generation not indicated
- 2-Channel, No emphasis
- Aux bits audio use

Thanks to the balanced design with transformers for coaxial output a connection to professional AES/EBU equipment is possible. The necessary cable adapter is exactly the same as the one for the input (see 8.1 Connections), except that a male XLR connector has to be used. Please note that DIGI32/8 has no option to change the channel status of the outgoing signal from 'Consumer' to 'Professional'.



Only a few professional products don't accept consumer format at their professional inputs. In this case a special format converter that change the channel status data is necessary.

12. Notes on the ADAT Interface

DIGI32/8 comes with two different driver methods in one driver. Using channel interleave there is only one device, the software in use divides the channels into 8 mono tracks. Because this easy to handle 'Windows native' method is not widely used the DIGI32/8 also supports Multi-Device operation. The driver routes the 8 tracks in 4 stereo devices. These 4 stereo devices can be used by nearly any software to record or playback more than 2 channels simultaneously, making DIGI32/8 compatible to a wide range of already existing software.

DIGI32/8 includes an intelligent hardware controller for ease of use. Whenever more than 2 channels are used, no matter with record, playback or both, the card switches into ADAT mode.

The Input switch is overwritten when more than 2 channels are used. If the Input switch is set to coaxial, and the display shows 44.1 kHz, using more than 2 channels immediately activates the optical input in ADAT mode.

When the Input switch is set to optical and an ADAT signal is supplied to the optical input the settings dialog of the DIGI32/8 indicates 'ADAT PLL Locked'. If now the Output function is set to 'Input' the card changes to ADAT mode to allow input monitoring of up to 8 channels.

If the software being used requires a continuous ADAT mode activate the switch 'Force Adat' in the Settings dialog. When using a 'normal' 2 track program to play or record a stereo file, you're not only able to use SPDIF but also any ADAT interface! Just activate 'Force ADAT' and choose the stereo pair in the device list box that corresponds to the channels you want the data being transferred to.

 *DIGI32/8 works in SPDIF- or ADAT mode, but not in both simultaneous. Thus using more than 2 channels no SPDIF signal will be available at the outputs.*

The stereo pairs work independent. This means you may use the 4 stereo pairs with different programs. A typical example would be to play back six channels from a harddisk recording program, and simultaneously use a real time synthesizer software like Generator from Native Instruments on the two remaining channels.

13. Multiclient Operation

13.1 General

The DIGI32/8 series supports multiclient operation. That means more than one program can be used at the same time. But this mode is only available as long as certain rules are followed. For a flawless multiclient operation with multiple programs the below guidelines have to be followed precisely.

 *Rule 1: Multiclient operation always requires the activation of Force Adat!*

After an activation of Force Adat all 4 output pairs can be used freely. You can use up to 4 different MME programs at the same time.

 *Rule 2: Multiclient operation always requires identical sample rates and bit resolutions!*

It is not possible to run one program at 44.1 kHz and another one at 48 kHz. Also it's not possible to run one program in 16 bit and another one in 24 (32) bit resolution.



Rule 3: It is not possible to use the same channels with different programs simultaneously.

If for example Generator uses channels 1/2, this output pair can't be used in WaveLab anymore.

14. Hotline - Troubleshooting

14.1 General

The newest information can always be found on our website www.rme-audio.com, section FAQ, Latest Additions.

Playback works but recording doesn't:

- Check that a valid input signal is at hand. In this case the Error LED on the hardware turns off, and the current sample frequency is shown under 'Settings'.
- If you are sure that a valid signal is being sent but the LED is still red, then check the currently selected input in the Settings dialogue.
- Check whether the DIGI32/8 has been selected as recording device in the audio application.
- Check whether the sample frequency set in the audio application ('Recording properties' or similar) matches the input signal.
- Check that there is no loop cabling present. If so set 'Clock Mode' to 'Master'.

The input signal cannot be monitored in real-time

- Monitoring has not been enabled (for example 'Global disable' in Cubase).

The recording or the playback is disturbed by crackling:

- Increase the quantity and size of the buffers in the software being used.
- Use a different cable (coaxial or optical) to cross-check them for defects.
- Check that there is no loop cabling present. If so set 'Clock Mode' to 'Master'.
- Increase the buffer size of the hard disk cache (example: from 64 kB to 256 kB).
- In case of loop cabling with an ADAT we recommend to use the ADAT as master (Int) and the DIGI as slave (AutoSync).
- Activate Busmaster mode for the hard disks. Windows: Device Manager, double-click on 'Disk drives', then on the required hard disk(s). Select 'DMA' in the Properties dialog.

Only the playback signal, but not the record (input) signal is present at the output

- The DIGI32 series has no hardware mixer. Therefore while playback is running only the playback signal is present at the output. The mixing of record and playback signal has to be done in the software (for example deactivate Cubase's 'ASIO Direct Monitoring').

The SPDIF output does not work

- The output operates in ADAT Mode, see *Output Status Display*. This may be caused by Force Adat being activated, an activation of more than the first (1/2) Master output busses in Cubase, or when 'Max I/O' (under Hardware & Driver) wasn't set to 2 in Logic.

14.2 Installation

More information on installation problems (which fortunately are very seldom, thanks to Plug and Play), can be found in the Tech Info 'Installation problems', located in the directory `\rmeaudio.web\techinfo` on the RME Driver CD.

The card is normally found in the Device Manager (>Settings/Control Panel/System<), in the category 'Sound-, Video- and Gamecontroller'. A double click on 'DIGI32/8' starts the properties dialog. Choosing 'Resources' shows Interrupt and Memory Range.

The newest information on hardware problems can always be found on our website www.rme-audio.com, section FAQ, Hardware Alert: about incompatible hardware.

The dialog 'New hardware component found' does not appear:

- Is the Error LED of the DIGI32/8 lit when no cable is connected to the optical input? If not, the card is either defect or not sitting properly in the slot.

When the card and the driver have been properly installed but no playback is possible:

- Check that the DIGI32/8 appears correctly in the Device Manager. If the device 'DIGI96' is marked with a yellow exclamation mark then either an address conflict or an IRQ conflict is present.
- If no yellow exclamation mark is present check the 'Resources' tab.
- Check that the DIGI32/8 has been set as 'transmitting device' in the software. Also check the settings under >Settings /Control Panel /Multimedia /Advanced<. Here the DIGI32 must appear as an audio device when it's been correctly installed, and can be set as the *Preferred Device* under 'Audio'.

The computer crashes whenever the DIGI32/8 is accessed:

- If your graphics board is an older Matrox Mystique or uses a '968' S3 chip, there could be a memory allocation error. Change the memory area allocated to the DIGI32/8 to *below* the area used by the graphics board (e.g. D0000000 - D0FFFFFF). Detailed information on this subject can be found in `\rmeaudio.web\techinfo\install.htm` on the RME Driver CD.

15. DIGICheck: Analysis, Test and Measurements

The DIGI96 series from RME is accompanied by a world wide unique software tool: DIGICheck, the incredible utility for test, measure and analysis of the digital audio data stream.

Although the DIGICheck software is fairly self-explanatory, it still includes a comprehensive online help. A detailed description of all functions and the technical background is also available in HTML format (digich.htm, in the **techinfo** directory on the RME Drivers CD or from our website). As DIGICheck has been developed for the DIGI96 series, only the following functions are available when using the DIGI32 series:

- **Level Meter.** High precision 24-bit resolution, 2/8 channels. Application examples: Peak level measurement, RMS level measurement, Over detection, phase correlation measurement, dynamic range and signal-to-noise ratios, RMS to peak difference (loudness), long term peak measurement, input check
- **Bit Statistics.** Shows the true resolution of audio signals as well as errors and DC offset
- **Totalyser.** Professional 30-band Analyser and Goniometer (Vector Scope)

To install DIGICheck, go to the **DIGICheck** directory on the RME Drivers CD and run *setup.exe*. Follow the instructions prompted on the screen.

16. TECH INFO

RME provides more information on the TECH INFO pages in the web (<http://www.rme-audio.com/techinfo/index.htm>), and in the directory **rmeaudio.web\techinfo** on the RME Driver CD. Here are some examples of available *Tech Infos*:

Synchronization (DIGI32 series)

Digital audio synchronization: technical background, problems

Installation Problems

..and their solutions

List of Driver Updates

Lists all driver updates and the changes in them

Configuration of Samplitude, Cubase, Logic, Cakewalk 7.0, Sonar and SAWPlus32 using the DIGI32 series. Step by step instructions

DIGICheck: Analysis, tests and measurements with the DIGI96 series

A description of DIGICheck, including technical basics.

TMS (Track Marker Support)

Description of the TMS technology to transfer CD- and DAT information.

17. Warranty

Each individual DIGI32/B undergoes comprehensive quality control and a complete test in a PC environment at RME before shipping. This may cause very slight signs of wear on the contacts (if the card looks like it was used one time before - it was). The usage of high grade components allows us to offer a full two year warranty. We accept a copy of the sales receipt as valid warranty legitimation.

RME's replacement service within this period is handled by the retailer. If you suspect that your card is faulty, please contact your local retailer. The warranty does not cover damage caused by improper installation or maltreatment - replacement or repair in such cases can only be carried out at the owner's expense.

RME does not accept claims for damages of any kind, especially consequential damage. Liability is limited to the value of the DIGI32/B. The general terms of business drawn up by Synthax OHG apply at all times.

18. Appendix

RME news, driver updates and further product information are available on our website:
<http://www.rme-audio.com>

If you prefer to read the information off-line, you can load a complete copy of the RME website from the RME Driver CD (in the **rmeaudio.web** directory) into your browser.

Distributor in Germany:

Synthax Audio AG, Am Pfanderling 62, D-85778 Haimhausen, Tel.: (49) 08133 / 91810

Manufacturer:

IMM Elektronik, Leipziger Str. 32, D-09648 Mittweida

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Current driver version: W98: 4.96, NT 3.86, W2k/XP: 2.0

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Thanx

All people involved in the project DIGI32/8 would like to say a big 'Thank You' to the following persons:

Hermann Knödler for believing in us
Hanspeter Widmer for debugging the 24 bit mode
Margit Tischler from Xilinx Germany for her support
Dirk Reile, who hasn't seen his ADAT for a long time
Detlev Müller and his team: good work!

CE

This device has been tested and found to comply with the limits of the European Council Directive on the approximation of the laws of the member states relating to electromagnetic compatibility (89/336/EEC) according to EN 55022 class B.

FCC Compliance Statement

Certified to comply with the limits for a Class B computing device according to subpart J or part 15 of FCC rules. See instructions if interference to radio reception is suspected.

FCC Warning

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This device complies with part 15 of FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference
2. This device must accept any interference received, including interference that may cause undesired operation.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help.

In order for an installation of this product to maintain compliance with the limits for a Class B device, shielded cables must be used for the connection of any devices external to this product.