PCISniffer 2

PCI Bus Analysis

Manual
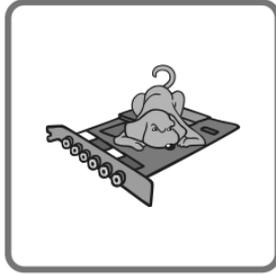
PCISniffer 2

Manual

Table of Contents

1   Introduction

Thank you very much for choosing PCISniffer. It is our expressed goal to offer a product, that fully meets your requirements and expectations. In case of having suggestions for improvement or not being satisfied with the software, we kindly ask you to send your suggestions and criticism to feedback@miray.de.

1.1   Brief description

PCISniffer is a tool for scanning the PCI busses of a PC and displaying PCI header data in readable form, directly gathered from the PCI devices.

1.2   Chapter summary

1 Introduction: General information about this manual and PCISniffer. Summary of the available editions and features.

2 Supported hardware: Minimal requirements and supported devices.

3 Quickstart: Short description for installation and program startup.

4 Installation: Creating a PCISniffer bootable medium (USB key or CD/DVD).

5 Program startup: Starting PCISniffer.

6 Controls: Description of the program screen and popup window.

7 Mode of operation: Mode of operation of particular functions.

8 Troubleshooting: If you encounter any problems when using PCISniffer, this chapter provides information and proposals for solution.

9 Miscellaneous: Legal disclaimer and feedback.

1.3   Character conventions

In this manual, keys on the keyboard are printed with an inverted background, for example Esc for the escape key or Return for the return key. Some keys are represented by a corresponding symbol, for example ↑ for the 'up'-key. Visual controls on the screen, particularly buttons are represented over- and underlined with italic font, for example *next*, *back*.

2   Supported hardware

This section contains information on the hardware supported when using PCISniffer. PCISniffer runs on PCs (x86) and supports a wide range of hardware.

2.1   Supported Systems

○ PC 80586 or higher, 500 MHz, 128 MB RAM, VGA (optimal: VESA support)

○ Keyboard & mouse: PS/2 or USB

○ Bootable CD drive or USB bootable medium

2.2   Compatibility

PCISniffer is developed to support general hardware standards. It has been tested on a large number of devices.

2.3   Standards

To support a wide spectrum of devices, PCISniffer implements the official interface standards for the particular device types. In addition, we perform extensive tests with each device type. If you experience an issue, though, our ▸ 9.3 Support will gladly help you finding a solution.

3   Quickstart

To start (=boot) PCISniffer, please follow these steps:

1. If you already have a bootable medium (CD/DVD or USB key) with PCISniffer, please proceed with step 4.

2. Plug a USB key to your PC or insert an empty CD/DVD into your CD/DVD writing drive. Start the Boot-Setup under:
   Programs ► *PCISniffer 2...* ► *Boot-Setup*

3. Select the desired CD/DVD drive or the desired USB key and create a bootable medium.

4. Boot the desired PC from this medium.

5. After starting PCISniffer, follow the course of the program. For further information, please refer to ▶ 6 Controls and ▶ 7 Mode of operation.

4   Installation

Create a bootable medium with ▸ 4.1 **Boot-Setup** or as described in ▸ 4.2 **ISO image**.

> **Note:** In case you have obtained PCISniffer on a medium (CD/DVD or USB key), you can start PCISniffer directly from there in many cases (▸ 5 **Program startup**).

4.1   Boot-Setup

Boot-Setup (▸ fig. 1) creates a bootable medium for starting (booting) PCISniffer on any PC.

To open Boot-Setup, start **PCISniffer.exe** from the program package. Then click on the *Create Bootable Medium* button.

The Boot-Setup program window contains the following control elements:

fig. 1: Boot-Setup

○ **UEFI bootcode**: To ensure the bootable medium can be used with a modern UEFI-BIOS, it additionally contains special UEFI bootcode. This allows the bootable medium to be used with both, old and new BIOSes. In case you encounter any problems when starting from the bootable medium, deactivate this option to create a bootable medium without UEFI bootcode.

○ **Create bootable USB key**: Select the medium from the list and click on *Make bootable*. The list will be updated automatically when connecting or disconnecting USB keys.

○ **Create bootable CD/DVD**: Select the desired CD/DVD drive from the list, insert an empty medium and click on *Create CD/DVD*.

Follow the instructions and wait for the program reporting successful completion. Then click on *Exit*. Continue at ▸ 3 **Quickstart** or ▸ 5 **Program startup**.

> **Note:** When creating a CD/DVD, please always use a new, empty writeable CD/DVD. Otherwise there may be problems when starting PCISniffer.

4.2   ISO image

The PCISniffer software package contains an ISO image (**PCISniffer.iso**):

It can be used to create a bootable PCISniffer-CD in any operating system and with any software supporting creation of CDs/DVDs from ISO images. Further information can be found in the manual of your CD/DVD authoring software.

1. Extract the file **PCISniffer.iso** from the PCISniffer software package.

2. Start your CD writing software and choose **Create CD from image file** (or similar caption, according to the respective CD writing software).

3. Specify the file **PCISniffer.iso** as an image file.

4. Insert a blank CD into the drive and write the CD.

After having accomplished these steps you have created a bootable PCISniffer CD. From this CD you can start PCISniffer directly on any PC with a bootable CD/DVD drive as described in ▶ **5 Program startup**.

> **Hint:** The easiest way of creating a bootable PCISniffer CD under Linux is using the software tool **cdrecord** with the following syntax:
> **cdrecord PCISniffer.iso**

5   Program startup

PCISniffer is a self-booting application, meaning the program cannot be started from Windows directly, but has to be booted when starting the PC.

5.1   Self-booting

Connect the bootable USB key or insert the bootable CD/DVD (▸ 4.1 Boot-Set-up). Start the PC and ensure that BIOS will boot from the desired medium. PCISniffer will then be launched from the bootable medium.

Note: In case your PC does not boot from the PCISniffer boot medium, press **F8**, **F11** or **F12** (BIOS dependent) immediately after turning on the PC to enter the boot menu and select the bootmedium.

5.1.1   UEFI and SecureBoot

PCISniffer will also boot on UEFI systems. SecureBoot mode is currently not supported and has to be deactivated in BIOS setup before booting.

5.2   Quit program

In the lower right of the Main Screen (▸ fig. 2) you find a symbol for powering off the PC. Click on this symbol or press the **Esc** key to quit PCISniffer.

Note: If you do not want to start PCISniffer when starting the computer for the next time, remember to remove the PCISniffer boot medium from the boot drive first.

6   Controls

This chapter describes the controls, for example the program screen or popup windows, used within the program.

6.1   General

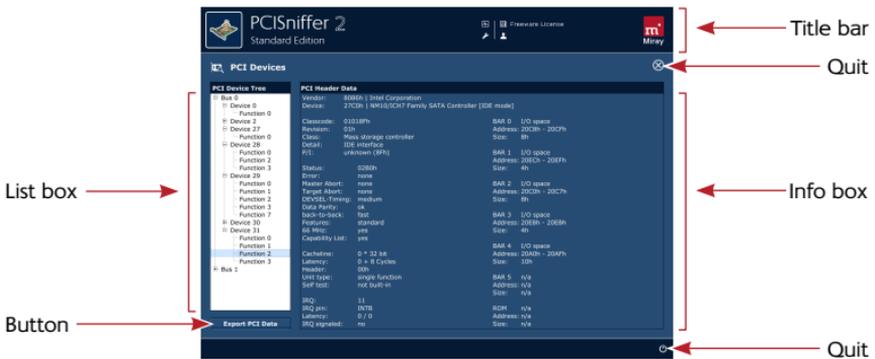In ▸ fig. 2, important controls are exemplified and denominated.

fig. 2: Graphical controls

6.2   Title bar

The title bar on top of the screen (▸ fig. 2) is visible at any time during program execution. It contains additional functions and information as described below.

6.2.1   System status

A click on the ▦ symbol or the **F5** key open the system status menu (▸ fig. 3). It contains the following entries:

fig. 3: System status menu

○ System information: Information on the Symobi system platform.

○ Task Manager: Opens the Symobi task manager.

6.2.2   Toolbox

A click on the 🖉 symbol or the `F6` key open
the toolbox menu (▶ fig. 4). It contains the follow-
ing entries:

Screenshot
Store the current screen to a PNG file

Store log
Store the System Log to a file

fig. 4: Toolbox menu

○ Screenshot : Storing a screen photo.

○ System Log: Stores the system log to a file
(▶ 8.1.2 System-Log).

6.2.3   License information

A click on the 📑 symbol or the `F7` key opens a window showing information
about the program license.

6.3   Mouse operation

The most convenient way to operate the program is by mouse. Some elements
show additional information in a small tooltip window when being hovered.

6.4   Keyboard operation

Keyboard operation always refers to the currently focused graphical control. It is
then highlighted by color, brightness, or an additional frame. With the `Tab` key
you can switch the focus in turn to the other operating elements. The following
control keys have a function when operating PCISniffer with a keyboard:

Key	Context	Function
`Ctrl` + `F4`	Control panel Main screen	Quit PCISniffer
`Ctrl` + `F5`	(any)	open ▶ 6.2.1 System status
`Ctrl` + `F6`	(any)	open ▶ 6.2.2 Toolbox
`Ctrl` + `F7`	(any)	show ▶ 6.2.3 License information
`Print`	(any)	Create and store a screenshot

6.5   Quitting & powering off

The close-button $\overline{X}$ or `Ctrl` + `F4` quits the
program. Another control for quitting the pro-
gram is located on the right below the program
screen (▶ fig. 2). Click on one of these icons to
power off or restart (▶ fig. 5) the computer.

Turn off computer ×

You can now turn off or restart the computer.

Shutdown   Reboot   Cancel

fig. 5: Powering off

7   Mode of operation

PCISniffer can browse and export PCI header data in readable form. The PCI device data is displayed as it was originally configured by the system at startup.

7.1   Browsing PCI Space

The list box on the left of the program screen (▸ fig. 2) contains a tree view of the system's PCI bus structure. The top elements are the different PCI busses. Each PCI bus has PCI devices, consisting of one or more PCI functions. Select a PCI function to have its PCI header data displayed in the info box on the right of the program screen. It presents PCI header data (see also http://en.wikipedia.org/wiki/PCI_configuration_space) of the selected PCI function in readable form.

7.2   Exporting PCI Data

You can also export PCI header data as displayed to a PDF file. Select the desired PCI bus, PCI device, or PCI function. Then click _Export PCI Data_ at the lower left of the program screen. This will open a popup (▸ fig. 6) where you can select the desired scope you want to have exported:

○ All PCI functions of all PCI devices of all PCI busses.

○ All PCI functions of all PCI devices of the selected PCI bus.

○ All PCI functions of the selected PCI device.

○ The selected PCI function.

Click _Save_ to proceed. This will open a save dialog (▸ fig. 7) where you can select the desired storage location. The exported data will be stored in PDF format, containing one page per PCI function.
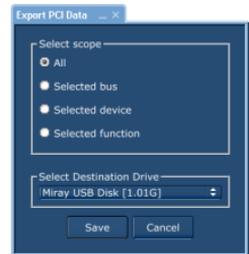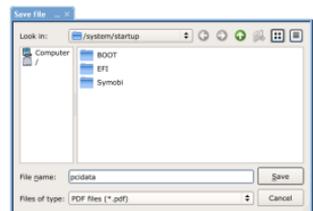

fig. 6: Export PCI Data

fig. 7: Save dialog

8   Troubleshooting

This paragraph describes possible problems when using PCISniffer and offers proposals for a solution. If there not a proposal given for a solution to a problem, you can gladly contact our ▸ 9.3 Support.

8.1   General

8.1.1   Retry

In case that something does not run as expected or desired at the first attempt, a trivial but often effective solution is to give it a second try. Especially in case of hardware issues this saves time, as many problems will be gone when connecting hardware a second time or using a different port.

8.1.2   System-Log

In case of any problems, even if they can be solved with the instructions following, but especially when contacting our ▸ 9.3 Support, please create a System Log first and send it to us. Just like a flight recorder, it contains information about program internal activities, which will lead us to a solution much faster – and you as well. Store the System Log when PCISniffer is running as follows:

1. If you have not booted PCISniffer from a USB key, please connect one to store the System Log to.

2. Klick on the Toolbox symbol (▸ 6.2.2 Toolbox).

3. Select the "Store System Log" option.
   If you have booted PCISniffer from a USB key, the System Log will be stored to it automatically. Otherwise, a popup will open and prompt you to select a storage medium.

4. A popup window appears, showing the storing progress as well as the storage location and the file name.

If an older System Log is found at the storage location, the number contained in the file name will be increased automatically. The latest System Log is always the one with the highest number.

8.2 Create a bootable PCISniffer medium

This chapter describes potential issues when creating a bootable medium for the self-booting version of PCISniffer.

8.2.1 USB key not working

If creating a bootable USB key or booting from this USB key fails, the USB key may lack a partition table. In this case, use a different USB key instead or format the USB key using the HP USB Disk Storage Format Tool (freeware). Download it at http://www.miray-software.com/public/tools/HPUSBFW_v2.2.3.exe. Afterwards, start ▸ 4.1 Boot-Setup again with this USB key.

8.2.2 CD/DVD writer not selectable

In no drive is offered for selection at CD/DVD writer although a CD/DVD writer is available on the system, the installed CD/DVD writing software may be the reason. It may reserve the drive exclusively, so that Boot-Setup cannot access it. Deactivate or uninstall the CD/DVD recording software in this case or use it to create a bootable CD/DVD from the ▸ 4.2 ISO image contained in the software package.

8.3 Booting PCISniffer

If there are issues when booting PCISniffer from USB key or CD/DVD (for example black screen or startup screen freezes), the following chapters provide suitable solutions.

8.3.2.1 BIOS-USB-Boot

If the PCISniffer bootable medium (USB key or USB CD/DVD drive) is not listed in the BBS menu (▸ 5.1 Self-booting), activate USB boot support in the BIOS setup first. Press **F2**, **Del**, or **F10** (depending on BIOS) to enter BIOS setup. The setting is to be found under different names and menu items, depending on the BIOS version. In most cases it is to be found under labels like USB, Boot and Legacy. In BIOS setup you can also select to boot from USB permanently, usually under the menu item Boot.

8.3.2.2 UEFI-Boot and SecureBoot

Current PC models often have a modern UEFI-BIOS. PCISniffer supports booting with UEFI. Some of these BIOSes also offer the SecureBoot function, which is not yet supported by PCISniffer for booting. Deactivate SecureBoot while using

PCISniffer. You can activate SecureBoot again afterwards. In case there is an is-
sue when booting with UEFI or SecureBoot, please create the PCISniffer bootable
medium again (▶ 4.1 Boot-Setup). with the "Include UEFI boot support" option
disabled. Start PCISniffer again from this bootable medium.

8.4   Input devices

If there is no reaction on mouse or keyboard input after starting PCISniffer, the
following subchapters render further information and a solution.

8.4.1   General

A solution that is generally very successful when having issues with input devices
is to connect an alternative USB input device of the same type.

8.4.2   Bluetooth devices

PCISniffer supports USB mice and keyboards (▶ 2 Supported hardware). This
also covers many cordless devices, if they are connected as USB devices.
Bluetooth input devices are currently not supported. In this case, please connect
an alternative USB device of the same type.

8.4.3   Problem devices

Few USB mice and keyboards contain a flawed implementation of the USB stan-
dard. Those devices may though work with Windows, since vendors usually test
against Windows, but will not work with other operating systems. In this case,
please use a different USB device temporarily. Create a ▶ 8.1.2 System-Log and
send it, together with information about vendor and device type of the non-
working device to our ▶ 9.3 Support.

9   Miscellaneous

9.1   Disclaimer

Parts of this product are based on works licensed under the GNU General Public License (GPL) and the Lesser GPL (LGPL). The appropriate licenses are to be found at http://www.gnu.org/copyleft/gpl.html and http://www.gnu.org/copyleft/lgpl.html. On request to support@miray.de we will send you a copy of the source code.

Although PCISniffer was programmed and tested with the largest possible caution, please understand that we cannot assume any liability for the proper functionality of the program and that we are not liable for damages resulting from its usage, subject to gross negligence and intention.

9.2   Feedback

We are highly interested in your feedback. If you encounter any program errors or if you have any improvement ideas, we will always try to fix the errors and implement or integrate your ideas. If you only want to tell us your opinions on this software, we would look forward to receiving such information from you.

Internet	miray-software.com
Email	feedback@miray.de
Fax	+49 (0)89 72013-647
Postal address	Miray Software AG
	Gaissacher Str. 18
	81371 Munich
	Germany

9.3   Support

If you encounter any problems with one of our products, our support team is gladly at your disposal. Please send us your inquiry through our homepage at miray-software.com/support or email us at support@miray.de.