PCAN-miniPCI

Mini PCI to CAN Interface

User Manual

PEAK System

Products taken into account

Product Name	Model	Item Number
PCAN-miniPCI Single Channel	One CAN channel	IPEH-003044
PCAN-miniPCI Dual Channel	Two CAN channels	IPEH-003045
PCAN-miniPCI Single Channel opto-decoupled	One CAN channel, galvanic isolation for CAN connection	IPEH-003046
PCAN-miniPCI Dual Channel opto-decoupled	Two CAN channels, galvanic isolation for CAN connections	IPEH-003047

The cover picture shows the product PCAN-miniPCI Dual Channel with and without opto-decoupling. Other product versions have an identical form factor but vary in equipment.

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1 Introduction

The PCAN-miniPCI card provides one or two CAN channels in computers with Mini PCI slots (e.g. in the embedded domain). Software interfaces exist for different operating systems, so programs can easily access a connected CAN bus.

Tip: At the end of this manual (Appendix B) you can find a Quick Reference with brief information about the installation and operation of the PCAN-miniPCI card.

1.1 Properties at a Glance

- Extension card for Mini PCI slot
- 1 or 2 High-speed CAN channels (ISO 11898-2)
- CAN transfer rates 40 kbit/s up to 1 Mbit/s, lower transfer rates on request
- CAN specifications 2.0A and 2.0B
- CAN connection 9-pin D-Sub male, pin assignment according to specification CiA 102
- Opto-decoupled versions: galvanic isolation up to 250 V for the CAN interface, separate for each CAN connector
- 5-Volt power supply at the CAN connector connectible by solder bridges, e.g. for external bus converter
- Device drivers and programming interfaces for operating systems Windows (from 2000 onwards) and Linux, for earlier Windows versions and other operating systems on request

Note: This manual describes the use of the PCAN-miniPCI card with Windows. You can find device drivers for Linux and the corresponding application information on the provided CD in the directory branch `Develop` and on our website under www.peak-system.com/linux.

1.2 System Requirements

The following prerequisites must be given, so that the PCAN-miniPCI card can be used properly:

- A vacant Mini PCI slot in the computer
- Operating system Windows (Vista 32-bit, XP SP2, 2000 SP4) or Linux (incl. 64-bit versions)

1.3 Scope of Supply

The scope of supply consists of the following parts:

- PCAN-miniPCI card
- Male D-Sub connector with 15 cm (6 inches) connecting cable (1 per CAN channel), other cable lengths on request
- CD with software (drivers, utilities), programming examples, and documentation

2 Installation

This chapter deals with the software setup for the PCAN-miniPCI card under Windows, the installation in the computer, and the connection of a CAN bus.

2.1 Installing the Software and the PCAN-miniPCI Card

Setup the software (driver) before installing the PCAN-miniPCI card into the computer.

To setup the software proceed as follows:

1. Make sure that you are logged in as user with administrator privileges (not needed for normal use of the PCAN-miniPCI card later on).
2. Insert the supplied CD into the appropriate drive of the computer. Usually a navigation program appears a few moments later. If not, start the file `Intro.exe` from the root directory of the CD.
3. On the page **English** > **Drivers** activate the entry **PCAN-miniPCI**.
4. Click on **Install now**. The setup program for the driver is executed.
5. Follow the instructions of the setup program. If a Windows security inquiry appears regarding the installation of device software, confirm it.

Tip: If you don't want to install the CAN monitor PCAN-View for Windows onto hard disk together with the driver, you have the

option to start the program later directly from CD without prior installation.

Do the following to install the PCAN-miniPCI card in the computer:

1. Shut down the computer.
2. Disconnect the computer from the power supply.
3. Open the computer's casing.
4. Insert the PCAN-miniPCI card into an empty Mini PCI slot. For details please refer to the documentation of the computer.
5. For each CAN channel mount a D-Sub connector with connection PCB into a respective hole of the computer casing.
6. For each CAN channel interconnect a D-Sub connector and the corresponding port on the PCAN-miniPCI card.

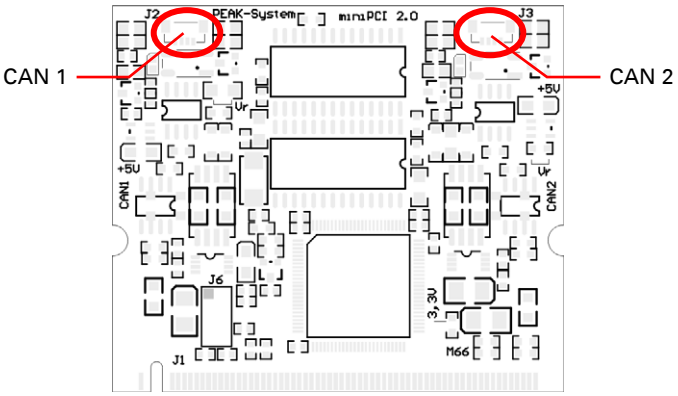

Figure 1: Positions of the CAN ports on the PCAN-miniPCI card

7. Close the computer's casing.
8. Reconnect the power supply of the computer.

Do the following to complete the initialization:

1. Turn on the computer and start Windows. Make sure again that you are logged in as user with administrator privileges.

   Windows notifies that new hardware has been detected.

2. Windows XP only: A Wizard dialog box appears. Follow its instructions and select the automatic software installation.

3. Afterwards you can work as user with restricted rights again.

After the driver has been successfully set up you can find the entry "PEAKCAN PCI-card" in the branch "CAN-Hardware" of the Windows Device Manager.

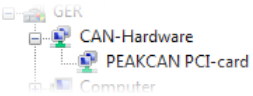

Figure 2: Representation of the PCAN-miniPCI card in the Windows Device Manager

2.2 Connecting the CAN Bus

A High-speed CAN bus (ISO 11898-2) is connected to the 9-pin D-Sub connector. The pin assignment corresponds to the specification CiA 102.

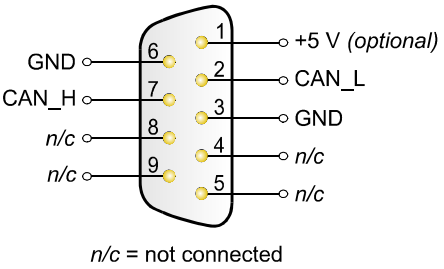

Figure 3: Pin assignment High-speed CAN
(view onto a D-Sub connector)

With pin 1 devices with low power consumption (e.g. bus converters) can be directly supplied via the CAN connector. At delivery this pin is not assigned. You can find a detailed description in the following section 2.3.

Tip: You can connect a can bus with a different transmission standard via a bus converter. PEAK-System offers different bus converter modules (e.g. PCAN-TJA1054 for a Low-speed CAN bus according to ISO 11898-3).

2.3 Supplying External Devices via the CAN Connector

A 5-Volt supply can optionally be routed to pin 1 of a D-Sub connector on the PCAN-miniPCI card (independently for each connector on the Dual Channel versions). Thus devices with low power consumption (e.g. bus converters) can be directly supplied via the CAN connector. The current consumption may not exceed **50 mA** per CAN connector.

When using this option the 5-Volt supply is connected to the power supply of the computer. The opto-decoupled versions of the card contain an interconnected DC/DC converter. In each case resettable 100-mA fuses are interposed.

Important note: The specification for Mini PCI slots provides a **maximum current output of 100 mA** on the 5-Volt bar. By the additional current consumption of external devices this limit can be exceeded and as a result the correct function of the computer may be affected.

Attention! Risk of short circuit! If the option described in this section is activated, you may only connect or disconnect CAN cables or peripheral systems (e.g. bus converters) to or from the PCAN-miniPCI card while the computer is de-energized.

Proceed as follows to activate the 5-Volt supply:

Set the solder bridge(s) on the PCAN-miniPCI card according to the desired settings. During this procedure take especially care not to produce unwanted short circuits on the card.

The following Figure 4 shows the positions of the solder fields on the PCAN-miniPCI card; the table below contains the possible settings.

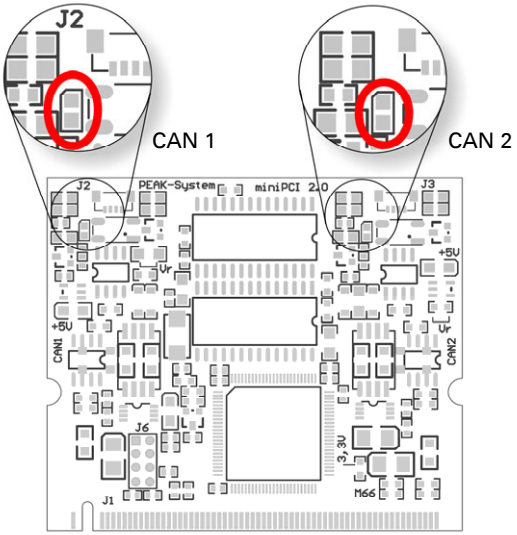

Figure 4: Positions of the solder fields on the PCAN-miniPCI card

5-Volt supply →	**None**	**Pin 1**
CAN channel 1 (left, near J2)		
CAN channel 2 (right, near J3)		

3 Software

This chapter deals with the provided CAN monitor PCAN-View for Windows and with the software interface to the PCAN-miniPCI card.

3.1 CAN Monitor PCAN-View for Windows

PCAN-View for Windows is a simple CAN monitor for viewing and transmitting CAN messages.

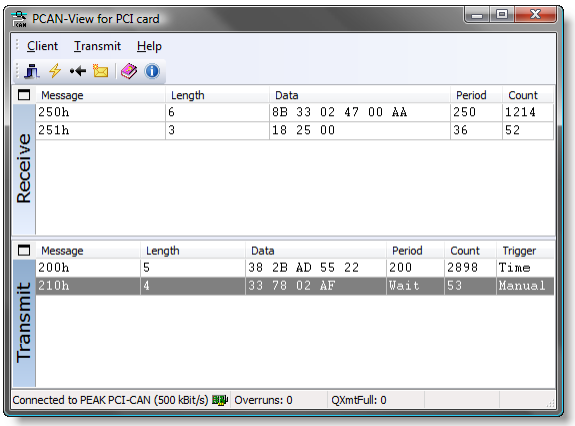

Figure 5: The main window of PCAN-View for Windows

Do the following to start and initialize PCAN-View:

1. If PCAN-View is already installed on the hard disk, open the Windows Start menu, go to **Programs** > **PCAN-Hardware**, and select the entry **PCAN-View PCI**.

   In order to start directly from the supplied CD without prior installation use the navigation program (`Intro.exe`), go to

English > **Tools**, and in the entry **PCAN-View for PCI** click on **Start**.

The dialog box for selecting the CAN hardware and for setting the CAN parameters appears.

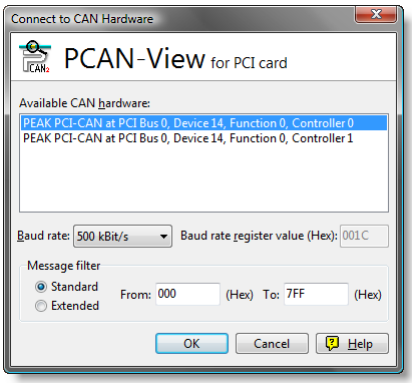

Figure 6: Selection of the CAN specific hardware and parameters

2. If you have a Dual Channel version of the PCAN-miniPCI card, select the used CAN channel from the list **Available CAN hardware**. Note that the count of the CAN controllers starts at 0, i.e. the CAN controller 0 is assigned to CAN channel 1.
3. From the list **Baud rate** select the transfer rate that is used by all nodes on the CAN bus.
4. Under **Message filter** you can limit the range of CAN IDs to be received, either for standard frames (11-bit IDs) or for extended frames (29-bit IDs).
5. Finally confirm the settings in the dialog box with **OK**. The main window of PCAN-View appears.

You can find further information about the use of PCAN-View in the help which you can invoke in the program via the menu **Help** or the F1 key.

3.2 Linking Own Programs with PCAN-Light

On the provided CD you can find files for software development in the directory branch `Develop`. They exclusively serve the linking of own programs to hardware by PEAK-System with the help of the installed device driver under Windows.

Further more the CD-ROM contains header files and examples for creating own applications in conjunction with the PCAN-Light drivers. Please read the detailed documentation of the interface (API) in each header file.

You can find further information in the text and help files (file name extensions `.txt` and `.chm`).

Notes about the License

Device drivers, the interface DLL, and further files needed for linking are property of the PEAK-System Technik GmbH and may be used only in connection with a hardware component purchased from PEAK-System or one of its partners. If a CAN hardware component of third party suppliers should be compatible to one of PEAK-System, then you are not allowed to use or to pass on the driver software of PEAK-System.

PEAK-System assumes no liability and no support for the PCAN-Light driver software and the necessary interface files. If third party suppliers develop software based on the PCAN-Light driver and problems occur during use of this software, please, consult the software provider. To obtain development support, you need to own a PCAN-Developer or PCAN-Evaluation version.

4 Technical Specifications

Connectors	
Computer	Mini PCI, type 3A (124-pin)
CAN	D-Sub (m), 9 pins Pin assignment according to specification CiA 102 Opto-decoupled versions: galvanic isolation up to 250 V (separate for each CAN connector)

CAN	
Specification	ISO 11898-2 High-speed CAN (up to 1 Mbit/s) 2.0A (standard format) and 2.0B (extended format)
Transfer rates	40 kbit/s - 1 Mbit/s Lower transfer rates on request
Controller	NXP (Philips) SJA1000T
Transceiver	NXP (Philips) TJA1040T

Supply			
Current consumption 3.3-Volt bar	max. 20 mA		
Current consumption 5-Volt bar		typ.	max.
	Single Channel:	30 mA	50 mA
	Dual Channel:	40 mA	80 mA
	Single Channel opto-dec.:	40 mA	60 mA
	Dual Channel opto-dec.:	60 mA	100 mA

Continued on the next page

Measures			
Size	Board: 60 x 51 mm (2 3/8 x 2 inches) (W x L)		
Weight		Card	Cable + D-Sub
	Single Channel:	10 g (0.35 oz.)	8 g (0.28 oz.)
	Dual Channel:	11 g (0.39 oz.)	16 g (0.56 oz.)
	Single Channel opto-dec.:	11 g (0.39 oz.)	8 g (0.28 oz.)
	Dual Channel opto-dec.:	12 g (0.42 oz.)	16 g (0.56 oz.)
Length connection cable card - D-Sub	15 cm (6 inches) Other cable lengths on request		

Environment	
Operating temperature	-20 - +70 °C (-4 - +158 °F)
Temperature for storage and transport	-40 - +100 °C (-40 - +212 °F)
Relative humidity	15% - 90 %, not condensing
EMC	EN 55024:2003-10 EN 55022:2007-04 EC directive 2004/108/EG

Appendix A CE Certificate

PCAN-miniPCI IPEH-003044/45/46/47 – EC Declaration of Conformity
PEAK-System Technik GmbH

Notes on the CE Symbol CE

The following applies to the PCAN-miniPCI products
IPEH-003044/45/46/47

EC Directive

This product fulfills the requirements of EC directive 2004/108/EG on "Electromagnetic Compatibility" and is designed for the following fields of application as per the CE marking:

Electromagnetic Immunity
DIN EN 55024, Publication date: 2003-10
Information technology equipment, immunity characteristics – Limits and methods of measurement (IEC/CISPR 24:1997, modified + A1:2001 + A2:2003);
German version EN 55024:1998 + A1:2001 + A2:2003

Electromagnetic Emission
DIN EN 55022, Publication date: 2007-4
Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement (IEC/CISPR 22:2005, modified);
German version EN 55022:2006

Declarations of Conformity

In accordance with the above mentioned EU directives, the EC declarations of conformity and the associated documentation are held at the disposal of the competent authorities at the address below:

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Signed this 11th day of March 2009

Appendix B Quick Reference

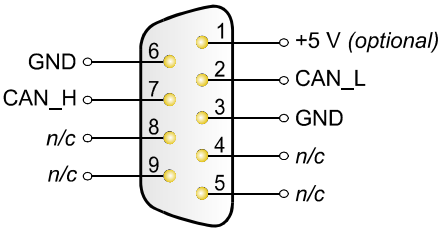
Software/Hardware Installation under Windows

Before installing the PCAN-miniPCI card into the computer please set up the corresponding software package from the supplied CD (with administrator privileges). Afterwards, insert the PCAN-miniPCI card into a vacant Mini PCI slot of the switched off (de-energized) computer. At the next start of Windows the PCAN-miniPCI card is recognized by Windows and the driver is initialized. After the driver has been successfully installed you can find the entry “PEAKCAN PCI-card” in the branch “CAN-Hardware” of the Windows Device Manager. Afterwards, you may also work as user with restricted rights.

Getting Started under Windows

Run the CAN monitor PCAN-View from the Windows Start menu as a sample application for accessing the PCAN-miniPCI card. For initialization of the PCAN-miniPCI card select the CAN channel (count starts at 0) and the CAN transfer rate (Baud rate).

High-speed CAN connector (D-Sub, 9 pins)



n/c = not connected