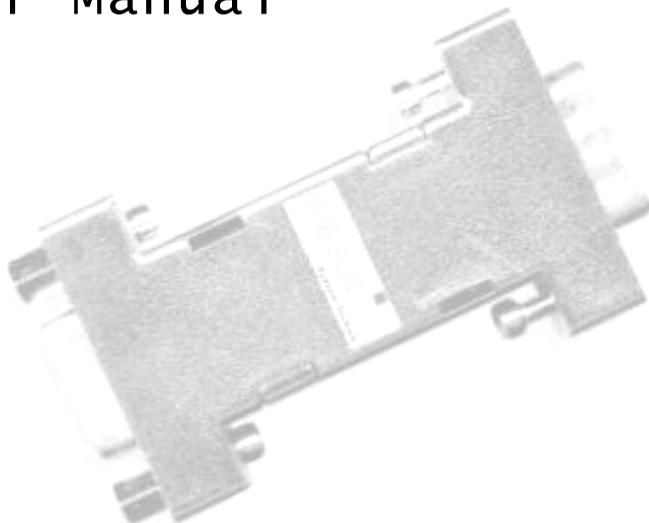


PCAN-Optoadapter

Plug-on Adapter for the Isolation of
CANS

User Manual



Products taken into account

Product Name	Model	Item Number
PCAN-Optoadapter		IPEH-002038

Last Update

08.09.2005

← Fully revised edition

All product names mentioned herein may be the trademarks or registered trademarks of their respective companies. Furthermore, "™" and "®" are not mentioned in each case in this manual.

© 2005 PEAK-System Technik GmbH

PEAK-System Technik GmbH
Otto-Röhm-Straße 69
D-64293 Darmstadt, Germany

Phone: +49 (0)6151-8173-20
Fax: +49 (0)6151-8173-29

www.peak-system.com
info@peak-system.com

Contents

1	Introduction	4
1.1	Properties at a Glance	4
1.2	Special Prerequisites for the Operation	4
1.3	Scope of Supply	5
2	Installation	6
2.1	Configuration	6
2.2	Connection on Primary Side	6
2.3	Connection on Secondary Side	7
3	Use	8
3.1	Signal Delay	8
4	Frequently Asked Questions (FAQ)	9
5	Technical Specifications	10
Appendix A	Certificates	11
A.1	CE	11

1 Introduction

The PCAN-Optoadapter is a plug-on adapter for the galvanic isolation of a HS-CAN bus. It is designed for direct connection to a PC/CAN adapter of the PCAN series (e.g. PCAN-USB).

1.1 Properties at a Glance

- └ Optical coupling and galvanic isolation with DC/DC converter up to 500 V
- └ Compatible to CAN norm ISO 11898 (High-speed CAN, transfer rates up to 1 MBit/s)
- └ Integrated CAN filter
- └ CAN connection 9-pin Sub-D male, pin assignment according to CiA recommendation DS102
- └ Power supply (5 V) via HS-CAN hardware of the PCAN series (no additional power supply unit needed)

1.2 Special Prerequisites for the Operation

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

- └ The power supply is done via pin 1 of the 9-pin female Sub-D connector (primary side). Therefore the attached PC/CAN adapter must provide 5 Volts. Please refer to the documentation of the CAN-Hardware.

- └ Since the PCAN-Optoadapter already contains a CAN bus termination on the primary side, the connected CAN adapter doesn't need to be terminated separately.

1.3 Scope of supply

The scope of supply normally consists of the following parts:

- └ Adapter with two connectors in a plastic housing
- └ Manual in printed form

2 Installation

2.1 Configuration

A configuration of the PCAN-Optoadapter is not needed. You can use it instantly. However, the hardware connected to the adapter's primary side must be configured, if applicable, in order to supply the PCAN-Optoadapter via the CAN bus (see also the following section).

2.2 Connection on Primary Side

The PCAN-Optoadapter is directly connected to a PC/CAN adapter with its so called primary side (female Sub-D connector).



Attention! Avoid connecting or removing the PCAN-Optoadapter during operation of the respective PC/CAN adapter and PC (power supply is on). The PCAN-Optoadapter or other electronic components may be harmed.

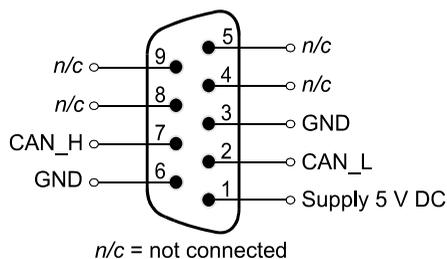


Figure 1: Assignment at the primary side (9-pin female Sub-D connector)

The lines for the differential CAN signal CAN_H and CAN_L are terminated on the adapter with an 60-Ω resistor (fixed). An additional termination at the PC/CAN adapter is not needed.

For general supply the adapter uses a direct voltage of +5 V. This must be applied to pin 1 of the CAN connector. The PC/CAN adapters of the PCAN series are able to provide 5 Volts on Pin 1. Please refer to the corresponding documentation.

2.3 Connection on Secondary Side

Connect the CAN bus to the so called secondary side (male Sub-D connector).

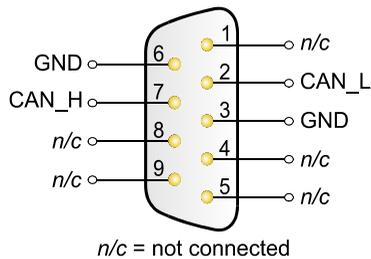


Figure 2: Assignment at the secondary side (9-pin male Sub-D connector)

3 Use

3.1 Signal Delay

Due to physical conditions a signal delay occurs in the PCAN-Optoadapter. This delay is tantamount to a specific cable length causing the same signal delay as the PCAN-Optoadapter. For the safe operation of the CAN the maximum bus length therefore is reduced.

The following table shows the maximum CAN bus length at different transfer rates.

Transfer rate \ Max. bus length	Without Optoadapter	With one Optoadapter	With two or more Optoadapters
1 MBit/s	46 m (50 yards)	17 m (19 yards)	not possible
500 kBit/s	112 m (122 yards)	83 m (91 yards)	53 m (58 yards)
250 kBit/s	244 m (267 yards)	215 m (235 yards)	185 m (202 yards)
125 kBit/s	508 m (556 yards)	479 m (524 yards)	449 m (491 yards)
50 kBit/s	1300 m (1422 yards)	1271 m (1390 yards)	1241 m (1357 yards)
20 kBit/s	3280 m (3587 yards)	3251 m (3555 yards)	3221 m (3523 yards)
10 kBit/s	6580 m (7196 yards)	6551 m (7164 yards)	6521 m (7131 yards)
5 kBit/s	13180 m (14414 yards)	13151 m (14382 yards)	13121 m (14349 yards)
Length reduction		29 m (32 yards)	59 m (65 yards)

4 Frequently Asked Questions (FAQ)

Question	Answer
Is it possible to use the adapter in another place of the CAN bus ?	In principle this is possible. Beside the needed power supply you should take into account that on the primary side (female Sub-D connector) the CAN lines are unalterable terminated with 60 Ω . Therefore a regular termination of that part of the CAN bus with two 120- Ω resistors is not possible. Further more for the common Sub-D connection you need a gender changer (simple 1:1 adapter with two male connectors).

5 Technical specifications

Supply voltage	+5 V DC (via pin 1 of the female Sub-D connector)
Current consumption	max. 120 mA
specification	ISO 11898 High-speed CAN (up to 1 MBit/s) 2.0A (standard format) and 2.0B (extended format)
transceiver	2 x Philips TJA1050
CAN termination	62 Ω on the primary side no termination on the secondary side
Galvanic isolation	500 V
Signal delay	about 145 ns
Operating temperature	-40 – +85 °C -40 – +185 °F
Storage temperature	-40 – +100 °C -40 – +212 °F
humidity	15 – 90 %, not condensing
EMC	EN 50081-1:1992 EN 50082-1:1997 EN 50081-2:1993 EN 61000-6-2:1999 EC directive 89/336/EEC
Size	about 63 x 34 x 17 mm (3 3/4 x 3 9/16 x 15/16 inches)
Weight	max. 30 g (2.5 oz.)

Design and specifications are subject to change without notice.

Appendix A Certificates

A.1 CE

PCAN-Optoadapter IPEH-002038 PEAK-System Technik GmbH	EC declaration of conformity										
<div style="display: flex; align-items: center; justify-content: center;"> <div style="margin-right: 10px;">Notes on the CE Symbol</div> <div style="font-size: 2em; font-weight: bold;">CE</div> </div>											
The following applies to the PCAN-Optoadapter product IPEH-002038											
EC Directive	This product fulfills the requirements of EC directive 89/336/EEC on "Electromagnetic Compatibility," and is designed for the following fields of application as per the CE marking:										
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="padding: 5px;">Field of Application</th> <th style="padding: 5px;">Requirement for Emitted Interference</th> <th style="padding: 5px;">Requirement for Noise Immunity</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">Residential, commercial and small businesses</td> <td style="padding: 5px;">EN 50081-1: 1992</td> <td style="padding: 5px;">EN 50082-1: 1997</td> </tr> <tr> <td style="padding: 5px;">Industrial</td> <td style="padding: 5px;">EN 50081-2: 1993</td> <td style="padding: 5px;">EN 61000-6-2: 1999</td> </tr> </tbody> </table>			Field of Application	Requirement for Emitted Interference	Requirement for Noise Immunity	Residential, commercial and small businesses	EN 50081-1: 1992	EN 50082-1: 1997	Industrial	EN 50081-2: 1993	EN 61000-6-2: 1999
Field of Application	Requirement for Emitted Interference	Requirement for Noise Immunity									
Residential, commercial and small businesses	EN 50081-1: 1992	EN 50082-1: 1997									
Industrial	EN 50081-2: 1993	EN 61000-6-2: 1999									
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:										
<div style="text-align: center;"> <p>PEAK-System Technik GmbH Mr. Wilhelm Im Benzweg 4 D-64293 Darmstadt Germany</p> <p>phone: +49 6151 81 73-20 fax: . +49 6151 81 73-29 info@peak-system.com</p> </div>											
											
Signed this 9 th day of August 2001											