# PCAN-Optoadapter

## Plug-on Adapter for Decoupling CAN Networks

# User Manual 2.0.0


PEAK System

## Products taken into account

| Product Name | Model | Part number |
|---|---|---|
| PCAN-Optoadapter | | IPEH-002038 |



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# 1 Introduction

The PCAN-Optoadapter is a universal plug-on adapter to allow galvanic isolation of High-speed CAN bus systems.

Its integrated logic means that decoupling can be installed at any point in the CAN network.

## 1.1 Properties at a Glance

- Plug-on adapter for decoupling the CAN bus for all PEAK CAN interfaces
- Optical decoupling and electrical isolation by DC/DC converters up to 500 V
- Bit rates up to 1 Mbit/s
- High-speed CAN transceiver NXP TJA1050
- CAN bus connection via D-Sub, 9-pin (in accordance with CiA® 102)
- Extended operating temperature range from -40 to 85 °C (-40 to 185 °F)
- All PEAK CAN interfaces can be set to the supply voltage required

## 1.2 System Requirements

- The power supply is done via pin 1 of the 9-pin female D-Sub connector (primary side). Therefore the attached CAN interface must provide 5 Volts.

- 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

- Adapter in plastic casing
- Manual in PDF format

# 2 Connectors

## 2.1 Connection Primary Side

The PCAN-Optoadapter is directly connected to a CAN interface with its so called primary side (D-Sub (f)).

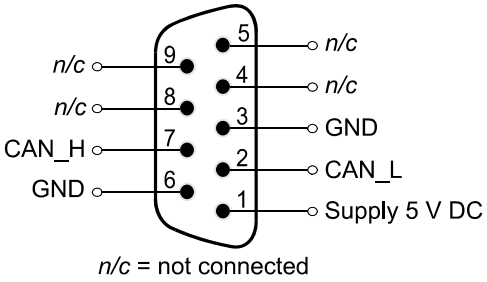


Figure 1: Pin assignment at the primary side

**Attention! Risk of short circuit!** When you connect the PCAN-Optoadapter to or remove it from a CAN interface, latter must be turned off (without power supply). Otherwise the PCAN-Optoadapter or other electronic components may be damaged.

The lines for the differential CAN signal CAN_H and CAN_L are terminated on the adapter with a 60-Ω resistor (fixed). An additional termination at the CAN interface 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 CAN interfaces of the PCAN series are able to provide 5 Volts on Pin 1.

## 2.2 Connection Secondary Side

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

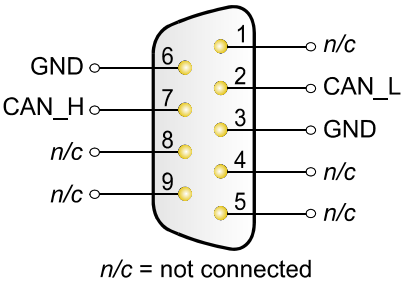


Figure 2: Pin assignment at the secondary side

# 3 Operation

**Note**: A configuration of the PCAN-Optoadapter is not needed. You can use it instantly.

## 3.1 Signal Delay

The PCAN-Optoadapter has a transit time delay of 145 ns. This corresponds to a cable length of 29 m. Therefore, you should consider the dependence of the maximum length of a CAN bus on the bit rate at the installation of the PCAN-Optoadapter. The following table shows the maximum possible CAN bus length at different bit rates:

| Bit rate | Bus length | Bus length with PCAN-Optoadapter |
|---|---|---|
| 1 Mbit/s | 40 m | 11 m |
| 500 kbit/s | 110 m | 81 m |
| 250 kbit/s | 240 m | 211 m |
| 125 kbit/s | 500 m | 471 m |
| 50 kbit/s | 1,3 km | For small bit rates, the delay of the adapter can be neglected |
| 20 kbit/s | 3,3 km | |
| 10 kbit/s | 6,6 km | |
| 5 kbit/s | 13,0 km | |

The listed values have been calculated on the basis of an idealized system and can differ from reality.

# 4 Technical Specification PCAN-Optoadapter

| | |
|---|---|
| **Connectors** | |
| CAN | D-Sub (m), 9 pins<br>Pin assignment according to specification CiA® 102 |
| **CAN** | |
| Specification | ISO 11898-2<br>High-speed CAN (up to 1 Mbit/s)<br>2.0A (standard format) and 2.0B (extended format) |
| Transceiver | NXP TJA1050 |
| Galvanic isolation | Up to 500 V |
| Termination | 62 Ω on the primary side<br>none on the secondary side |
| Signal delay | ca. 145 ns |
| **Power supply** | |
| Supply voltage | +5 V = via pin 1 of D-Sub (f) |
| Power consumption | max. 120 mA |
| **Measures** | |
| Size | 63 x 34 x 17 mm |
| Weight | 25 g |
| **Environment** | |
| Operating temperature | -40 - +85 °C (-40 to 185 °F) |
| Temperature for storage and transport | -40 - +100 °C (-40 to 212 °F) |
| Relative humidity | 15 - 90 %, not condensing |
| EMC | EN 55024: 2003-10<br>EN 55022: 2008-05<br>EC directive 2004/108/EG |

# Appendix A CE-Certificate

PCAN-Optoadapter IPEH-002038 – EC Declaration of Conformity
PEAK-System Technik GmbH

**Notes on the CE Symbol** CE

The following applies to the PCAN-Optoadapter products IPEH-002038

**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: 2008-05
Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement (IEC/CISPR 22:2005, modified + A1:2005);
German version EN 55022:2006 + A1:2007

**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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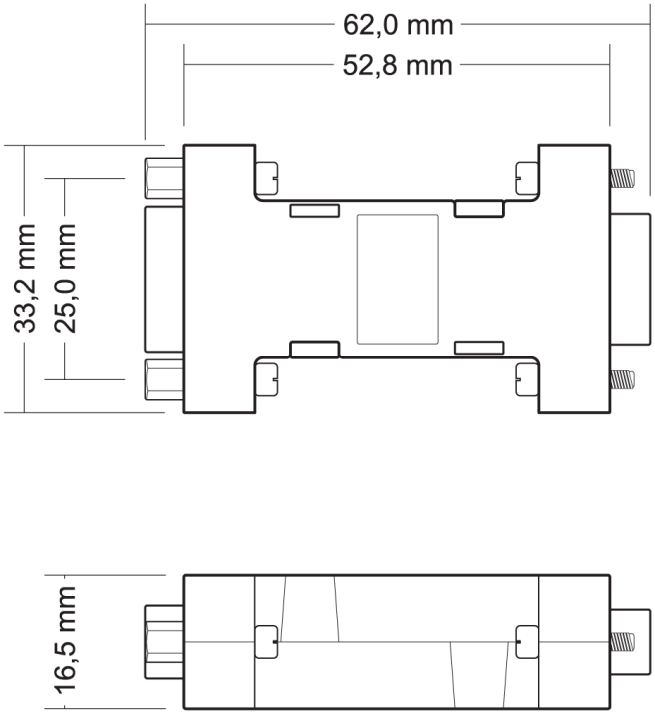
Signed this 4th day of October 2011

# Appendix B Dimension Drawing




The figure doesn't show the actual size of the product.