

# PCAN-Optoadapter

Plug-on Adapter for Decoupling CAN Networks

## User Manual



Document version 3.1.0 (2019-03-18)

**PEAK**  
System

## Relevant products

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 a CAN bus for PEAK CAN interfaces
- └ Galvanic isolation by DC/DC converters up to 500 V
- └ Bit rates up to 1 Mbit/s
- └ High-speed CAN transceiver NXP PCA82C251
- └ CAN bus connection via D-Sub, 9-pin (in accordance with CiA® 303-1)
- └ 120 Ohm bus termination
- └ Power supply (5 V) through pin 1 of the High-speed CAN connection. Nearly all CAN interfaces by PEAK-System can provide the required supply
- └ Extended operating temperature range from -40 to 85 °C (-40 to 185 °F)

## 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 on this side.

### **1.3 Scope of supply**

- └ Adapter in plastic casing
- └ Manual in PDF format

## 2 Connectors

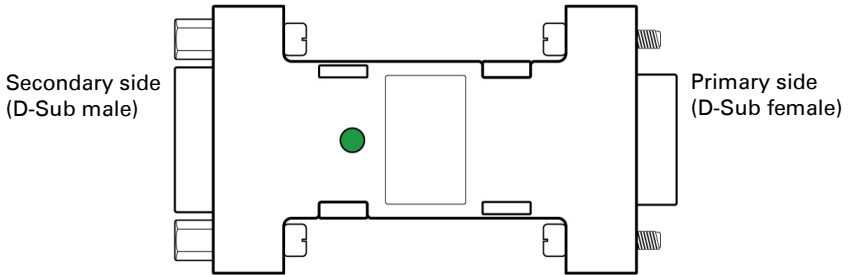


Figure 1: Top view PCAN-Optoadapter

### 2.1 Connection Primary Side

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

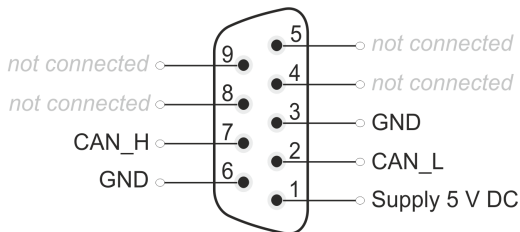


Figure 2: Pin assignment at the primary side (D-Sub female)

The lines for the differential CAN signal CAN\_H and CAN\_L are terminated on the adapter with a 120-Ω resistor (fixed). An additional termination at the CAN interface is not needed.

## 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® 303-1.

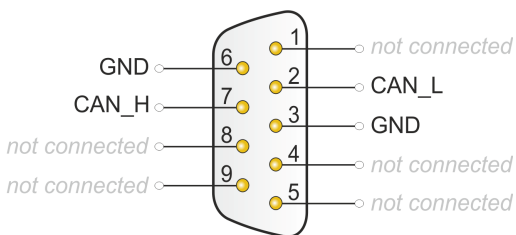


Figure 3: Pin assignment at the secondary side (D-Sub male)

## 3 operation

### 3.1 operation

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

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.

When the 5 V supply is active, the LED on the PCAN-Optoadapter is **green**.



**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.



## 3.2 Signal Delay

The PCAN-Optoadapter has a transit time delay of approx. 80 ns. This corresponds to a cable length of 16 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	24 m
500 kbit/s	110 m	94 m
250 kbit/s	240 m	224 m
125 kbit/s	500 m	484 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.

## 3.3 Status LED

The status LED on the top of the adapter indicates, whether it is correct supplied. In this case, the LED is continuously **green**.

## 4 Technical specification

### Connectors

CAN	D-Sub (m), 9 pins Pin assignment according to specification CiA® 303-1
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### CAN

Specification	ISO 11898-2, High-speed CAN 2.0A (standard format) and 2.0B (extended format)
Bit rates	0 kbit/s - 1 Mbit/s
Transceiver	NXP PCA82C251
Galvanic isolation	Up to 500 V
Termination	120 $\Omega$ on the primary side none on the secondary side
Signal delay	approx. 80 ns

### Power supply

Supply voltage	+5 V = via pin 1 of D-Sub female (GND pin 3; pin 6)
Power consumption	max 100 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

**Conformity**

EMV	Directive 2014/30/EU DIN EN 55024:2016-05 DIN EN 55032:2016-02
RoHS 2	Directive 2011/65/EU DIN EN 50581 VDE 0042-12:2013-02


# Appendix A CE-Certificate

## EU Declaration of Conformity



This declaration applies to the following product:

Product name: PCAN-Optoadapter  
Item number(s): IPEH-002038  
Manufacturer: PEAK-System Technik GmbH  
Otto-Roehm-Strasse 69  
64293 Darmstadt  
Germany

 We declare under our sole responsibility that the mentioned product is in conformity with the following directives and the affiliated harmonized standards:

**EU Directive 2011/65/EU (RoHS 2)**

**DIN EN 50581 VDE 0042-12:2013-02**

Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances;  
German version EN 50581:2012

**EU Directive 2014/30/EU (Electromagnetic Compatibility)**

**DIN EN 55024:2016-05**

Information technology equipment – Immunity characteristics – Limits and methods of measurement (CISPR 24:2010 + Cor.:2011 + A1:2015);  
German version EN 55024:2010 + A1:2015

**DIN EN 55032:2016-02**

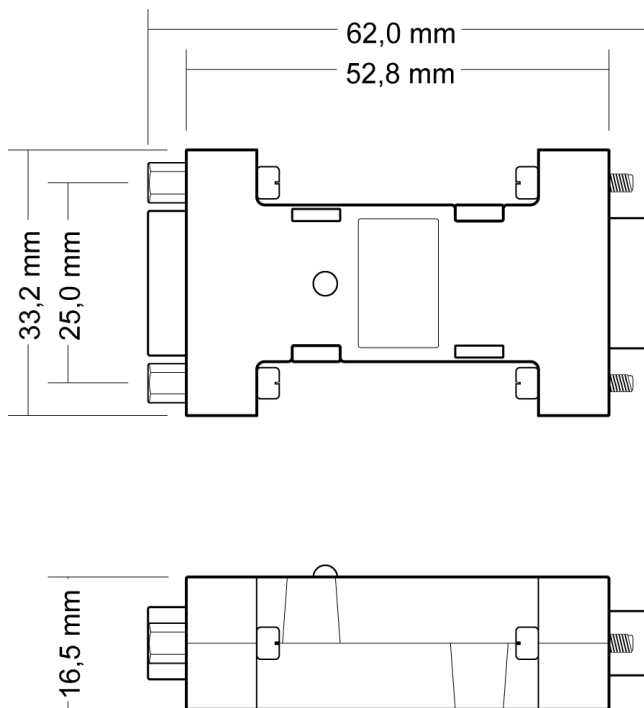
Electromagnetic compatibility of multimedia equipment - Emission Requirements (CISPR 32:2015);  
German version EN 55032:2015

Darmstadt, 22 February 2019

A handwritten signature in black ink, appearing to read "Uwe Wilhelm".

Uwe Wilhelm, Managing Director

## Appendix B Dimension Drawing



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