

PCAN-Optoadapter

User Manual



Relevant product

Product name	Part number
PCAN-Optoadapter	IPEH-002038

Imprint

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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.

The PCAN-Optoadapter can be used in CAN FD buses with data bit rates up to 2 Mbit/s and nominal bit rates up to 1 Mbit/s.

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 from 5 kbit/s up to 1 Mbit/s
- High-speed CAN transceiver NXP PCA82C251
- Suitable for the use in CAN FD buses with data bit rates up to 2 Mbit/s and nominal bit rates up to 1 Mbit/s
- CAN bus connection via D-Sub, 9-pin (in accordance with CiA® 106)
- Status LED for supply voltage indication
- 120-Ohm bus termination at the female D-Sub connector
- 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.

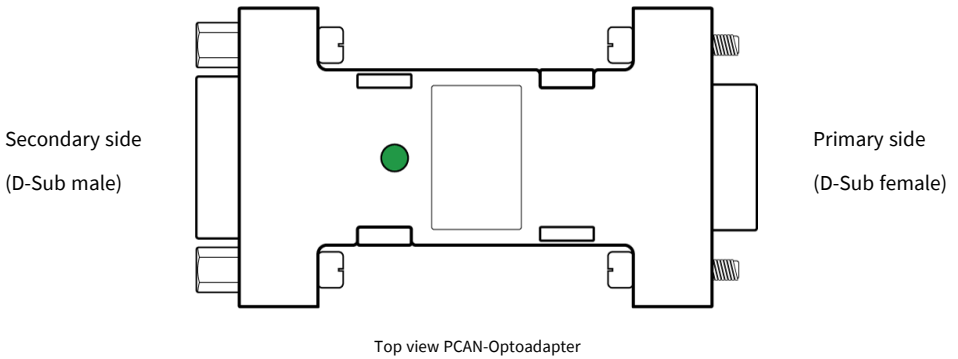
1.3 Scope of Supply

- PCAN-Optoadapter in plastic casing

Download

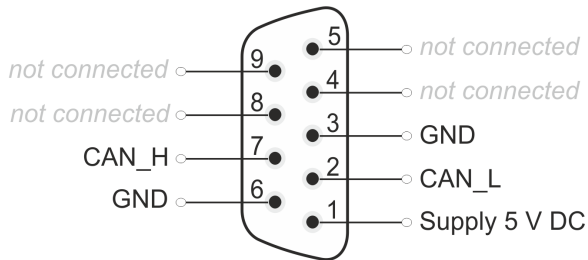
- Manual in PDF format

2 Connectors



2.1 Connection Primary Side

The PCAN-Optoadapter is connected to the CAN interface on the primary side.

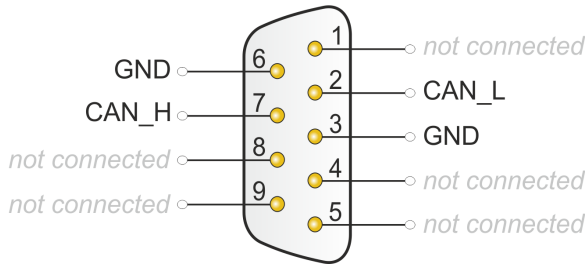


Pin assignment at the primary side (D-Sub female)

The lines for the differential CAN signal CAN_H and CAN_L are terminated on the adapter with a 120-Ohms 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® 106.



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-Volt 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 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 LED on the top of the PCAN-Optoadapter indicates, whether it is correctly 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® 106
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CAN

Specification	ISO 11898-2, High-speed CAN 2.0A (standard format), 2.0B (extended format) and CAN FD (Flexible Data Rate)
Bit rates	5 kbit/s to 1 Mbit/s (with CAN FD up to 2 Mbit/s)
Transceiver	NXP PCA82C251
Galvanic isolation	up to 500 V
Termination	120 Ohm 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 (W x H x D) see also Dimension Drawing Appendix B
Weight	25 g

Environment

Operating temperature	-40 to +85 °C (-40 to +185 °F)
Temperature for storage and transport	-40 to +100 °C (-40 to +212 °F)
Relative humidity	15 to 90 %, not condensing

Conformity

RoHS	EU Directive 2011/65/EU (RoHS 2) + EU Directive 2015/863/EU (amended list of restricted substances) DIN EN IEC 63000:2019-05
EMC	EU Directive 2014/30/EU DIN EN 55032:2022-08 DIN EN 55035:2018-04

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-Röhm-Straße 69
64293 Darmstadt
Germany

CE 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) + 2015/863/EU (amended list of restricted substances)

DIN EN IEC 63000:2019-05

Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances (IEC 63000:2016)

EU Directive 2014/30/EU (Electromagnetic Compatibility)

DIN EN 55032:2022-08

Electromagnetic compatibility of multimedia equipment - Emission requirements (CISPR 32:2015 + COR1:2016 + A1:2019)

DIN EN 55035:2018-04

Electromagnetic compatibility of multimedia equipment - Immunity requirements (CISPR 35:2016, modified)

Darmstadt, 5 September 2022

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

Uwe Wilhelm, Managing Director

Appendix B Dimension Drawing

