PCAN-Optoadapter

User Manual

Relevant product

Product name	Part number
PCAN-Optoadapter	IPEH-002038

Imprint

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Document version 4.2.0 (2024-06-11)

Contents

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

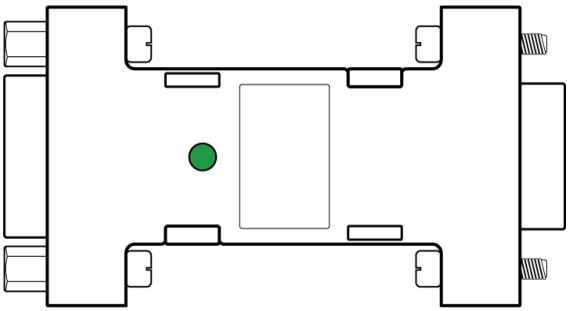
Download

- Manual in PDF format

2 Connectors

Secondary side

(D-Sub male)



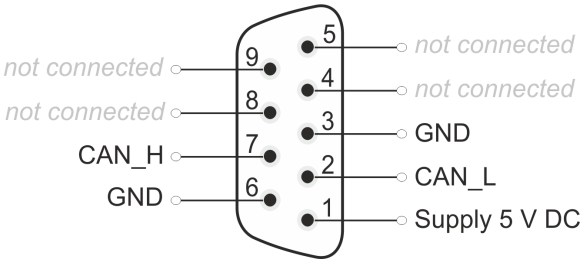
Primary side

(D-Sub female)

Top view PCAN-Optoadapter

2.1 Connection Primary Side

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

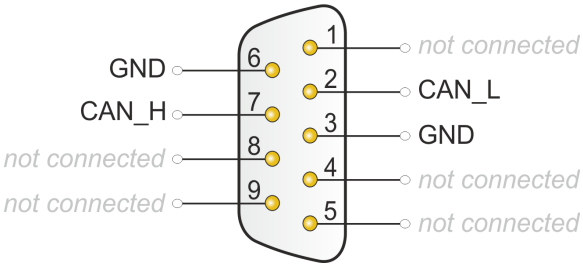


Pin assignment at the primary side (D-Sub female)

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**.

> **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

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 C
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) + 2015/863/EU 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 Leydheckerstraße 10 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) + 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);
German version of EN IEC 63000:2018

EU Directive 2014/30/EU (Electromagnetic Compatibility)

DIN EN 55032:2022-08
Electromagnetic compatibility of multimedia equipment - Emission requirements (CISPR 32:2015);
German version of EN 55032:2015 + AC:2016 + A11:2020 + A1:2020

DIN EN 55035:2018-04
Electromagnetic compatibility of multimedia equipment - Immunity requirements (CISPR 35:2016, modified);
German version of EN 55035:2017

Darmstadt, 7 June 2024

Uwe Wilhelm, Managing Director

Appendix B UKCA Certificate

UK Declaration of Conformity

This declaration applies to the following product:

Product name: **PCAN-Optoadapter**

Item number(s): **IPEH-002038**

Manufacturer:
PEAK-System Technik GmbH
Leydheckerstraße 10
64293 Darmstadt
Germany

UK authorized representative:
Control Technologies UK Ltd
Unit 1, Stoke Mill,
Mill Road, Sharnbrook,
Bedfordshire, MK44 1NN, UK

UK CA

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

The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

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);
German version of EN IEC 63000:2018

Electromagnetic Compatibility Regulations 2016

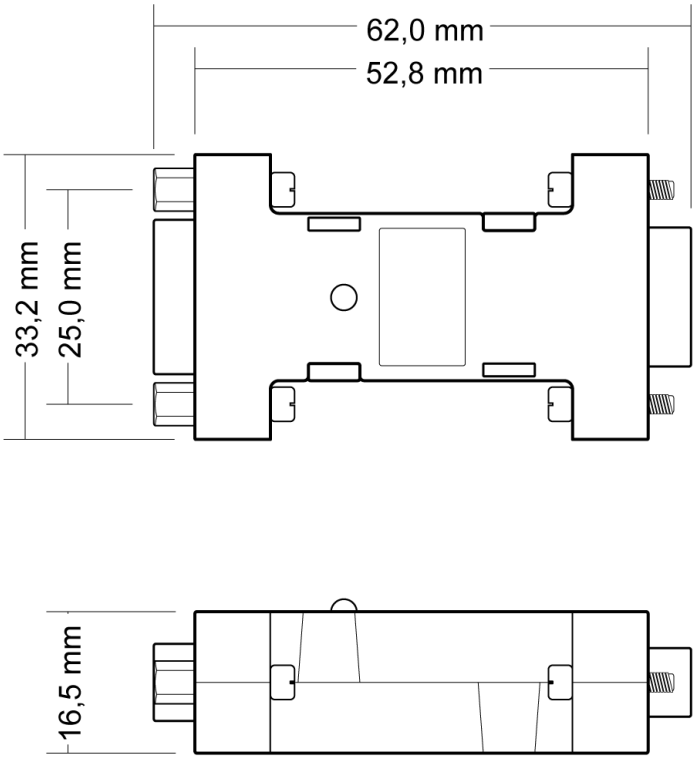
DIN EN 55032:2022-08
Electromagnetic compatibility of multimedia equipment - Emission requirements (CISPR 32:2015);
German version of EN 55032:2015 + AC:2016 + A11:2020 + A1:2020

DIN EN 55035:2018-04
Electromagnetic compatibility of multimedia equipment - Immunity requirements (CISPR 35:2016, modified);
German version of EN 55035:2017

Darmstadt, 7 June 2024

Uwe Wilhelm, Managing Director

Appendix C Dimension Drawing



Appendix D Disposal

The product must not be disposed of in household waste. Dispose of the product properly in accordance with local regulations.