PCAN-USB X6

User Manual

PEAK System

Relevant Products

Product name	Model	Attribute	Part number
PCAN-USB X6 with D-Sub connectors		Red corners	IPEH-004062
PCAN-USB X6 with D-Sub connectors	galvanic isolation for CAN connection	Gray corners	IPEH-004064
PCAN-USB X6 with M12 connectors	galvanic isolation for CAN connection	Gray corners	IPEH-004063

The cover picture shows the products PCAN-USB X6 with M12 connectors (left) and with D-Sub connectors (right).

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Document version 2.0.1 (2022-04-21)

Contents

1 Introduction

CAN interface PCAN-USB X6 for the USB port which allows the connection of up to six CAN FD or CAN buses. The device is therefore best suited for working with multiple CAN networks like the use in test benches with hardware-in-the-loop (HIL) simulations for motor vehicles or in the product line testing of CAN-based products. The CAN interface is installed in an aluminum profile casing and is shipped in versions with D-Sub connectors or M12 circular connectors. Especially the M12 version is suitable for use in harsh environments.

IPEH-004063/-64: Galvanic isolation up to 300 volts for each CAN channel protects against the transmission of electrical interference peaks between the CAN channels and the computer.

The CAN FD standard (CAN with Flexible Data rate) is primarily characterized by higher bandwidth for data transfer. The maximum of 64 data bytes per CAN FD frame (instead of 8 so far) can be transmitted with bit rates up to 12 Mbit/s. CAN FD is downward compatible to the CAN 2.0 standard, CAN FD nodes can be inserted into already existing CAN networks without CAN FD extensions.

The monitor software PCAN-View and the programming interface PCAN-Basic for the development of applications with CAN connection are included in the scope of supply and support CAN FD.

This manual describes the use of the CAN interface with **Windows**. Device drivers and application information for **Linux**: www.peak-system.com/quick/DL-Driver-E

At the end of this manual you can find a Quick Reference with brief information about the installation and operation of the CAN interface.

1.1 Properties at a Glance

- CAN interface for High-speed USB 2.0 (compatible to USB 1.1 and USB 3.0)
- 6 High-Speed CAN channels (ISO 11898-2)
  - Complies with CAN specifications ISO 11898-1 for CAN and CAN FD
  - CAN FD support for ISO and Non-ISO standards switchable
  - CAN FD bit rates for the data field (64 bytes max.) from 25 kbit/s up to 12 Mbit/s
  - CAN nominal bit rates from 25 kbit/s up to 1 Mbit/s
  - FPGA implementation of the CAN FD controller
  - NXP TJA1044GT CAN transceiver
  - Alternative pluggable transceiver modules on request
- Galvanic isolation up to 300 V per CAN connection (only for IPEH-004063 and IPEH-004064)
- Time stamp resolution 1 µs
- Status LEDs for CAN channels, USB upstream, and power supply
- CAN connection via D-Sub, 9-pin or M12 circular connectors, 5-pin (pin assignment of both connectors in accordance with CiA® 303-1)
- Aluminum casing with increased Ingress Protection IP64 (only for IPEH-004063)
- High-speed USB 2.0 downstream port (only for IPEH-004062 and IPEH-004064)
- CAN termination can be activated through a solder jumper, separately for each CAN channel
- Measurement of bus load including error frames and overload frames on the physical bus
- Induced error generation for incoming and outgoing CAN messages
- Power supply from 8 to 30 V
- Extended operating temperature range from -40 to 85 °C (-40 to 185 °F)

1.2 System Requirements

- Voltage supply in the range of 8 to 30 V DC

Computer with:

- Operating system Windows® 11 (64 bit), 10 (32/64 bit) or Linux (32/64-Bit)
- A vacant USB port (USB 1.1, USB 2.0 or USB 3.0) or a self-powered USB hub

> **Malfunction!** Do not use a USB extension cable to connect the CAN interface to the computer. Extension cables does not comply with the USB specification.

1.3 Scope of Supply

- CAN interface PCAN-USB X6 in aluminum casing
- IPEH-004062 and IPEH-004064: Mating connector for power supply
- IPEH-004063: Cables for power supply and USB connection

> **Note:** The scope of supply does not contain a power supply unit for the device. There is no supply via the USB connection to the PC.

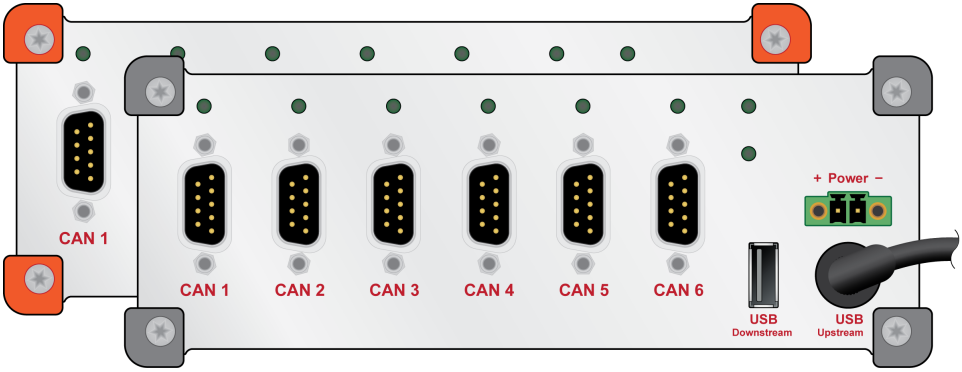
Downloads

- Device drivers for Windows® 11 (64 bit), 10 (32/64 bit) and Linux (32/64-bit)
- CAN monitor PCAN-View for Windows
- Programming interface PCAN-Basic for developing applications with CAN connection
- Programming interfaces for standardized protocols from the automotive sector

2 Connectors

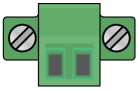
Read the corresponding chapter on the connections of your PCAN-USB X6.

2.1 PCAN-USB X6 with D-Sub Connectors



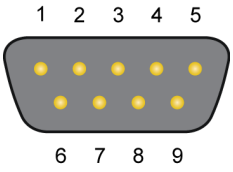
2.1.1 Power Supply over Mating Connector

The power supply is possible in a range from 8 to 30 V DC. The "Power" input is electronically protected with reverse polarity and overvoltage protection. The power supply is connected via the supplied mating connector.

Power supply	Mating connector	Polarity	
 1 2	 1 2	V+	1
		GND	2

2.1.2 CAN Connection

The pin assignment for CAN corresponds to the specification CiA® 303-1:

D-Subconnector, Type: DE9	Assignment	
	CAN_GND	3, 6
	CAN_High	7
	CAN_Low	2
	ohne	1, 4, 5, 8, 9

2.1.3 USB Upstream

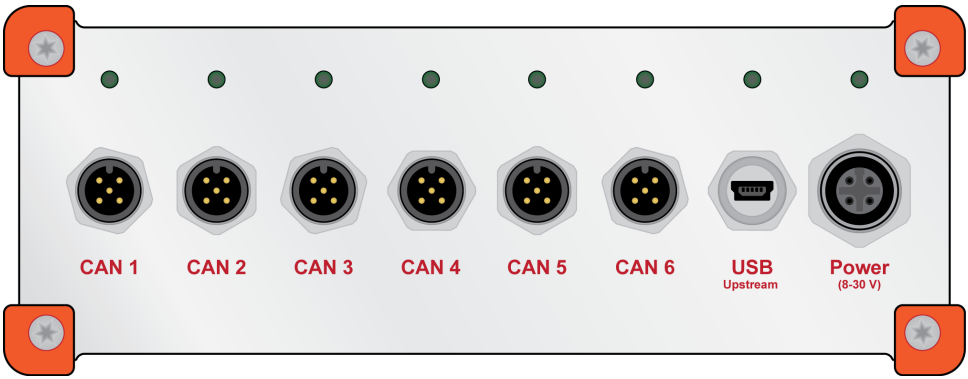
For connecting the PCAN-USB X6 to a computer.

2.1.4 USB Downstream

For general use of USB devices. The USB Downstream port is passed through to the computer and is used to connect another USB device to the computer.

Malfunction! Connecting another CAN interface to the USB downstream port is not as intended.

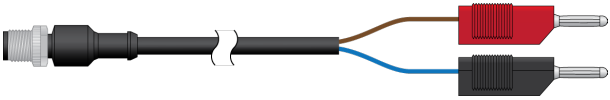
2.2 PCAN-USB X6 with M12 Connectors



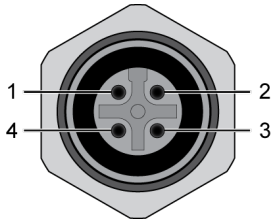
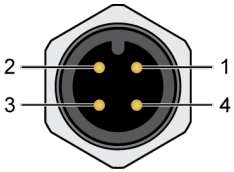
2.2.1 Power Supply

The power supply via the female panel connector is possible in a range from 8 to 30 V DC. The "Power" input is electronically protected with reverse polarity and overvoltage protection.

The power supply is connected via the supplied power cable:

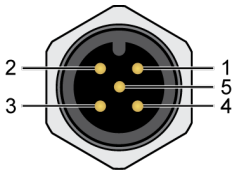
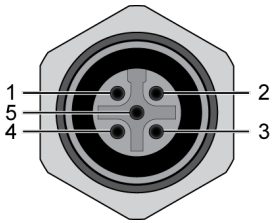


The pin assignment is as follows:

M12 female panel connector „Power“	M12 male cable connector on power cable	Assignment	
		V+	1
		none	2
		GND	3
		none	4

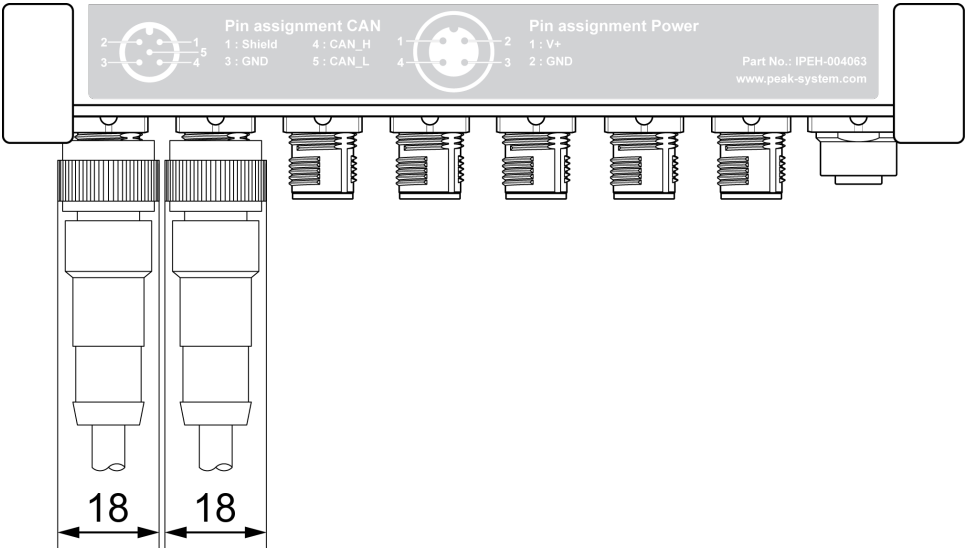
2.2.2 CAN Connection

The pin assignment of the six M12 male panel connectors corresponds to the specification CiA® 303-1:

M12 male panel connectors (CAN connectors 1 to 6)	M12 female cable connector on CAN bus	Assignment	
		Shield	1
		none	2
		CAN_GND	3
		CAN_High	4
		CAN_Low	5

Maximum Diameter of M12 Female Cable Connector

The distance between the M12 male panel connector is 19 mm. Therefore, the maximum outer diameter of the M12 female cable connector is limited to 18 mm for a proper connection.



Recommendations for Suitable M12 Female Cable Connectors

The M12 male panel connector for CAN on PCAN-USB X6 are from the manufacturer Phoenix, type "Speedcon". With the associated M12 female cable connector, the connection is made with a quick-release fastener. Cable connectors of other types are screwed on. Among others, the following assembled M12 female cable connectors with free cable end are suitable:

Manufacturer	Series	Type	Example	Order Number
Phoenix	SAC-5P	FS-SCO	SAC-5P- 5,0-920/FS SCO	1518229
Phoenix	SAC-5P	M12FS	SAC-5P- 5,0-920/M12FS	1507489
Binder	763	unshielded	M12-A female cable connector, Contacts: 5	77 3430 0000 20005-0500
Binder	763	shielded	M12-A female cable connector, Contacts: 5	77 3530 0000 50705-0500

2.2.3 USB Upstream

The connection of the PCAN-USB X6 to the computer is done via the supplied USB cable:

2.3 Internal Termination

For each CAN channel a termination can be activated via solder bridges on the board. This switches a resistor of 120 Ω between CAN_High and CAN_Low. The conversion is done for an additional improvement of the CAN signal as split termination.

Tipp: We recommend to do termination at the CAN cabling, for example with the terminating resistors PCAN-Term (IPEK-003002) or PCAN-MiniTerm (IPEK-003002-Mini). Thus, CAN nodes can be flexibly connected to the bus.

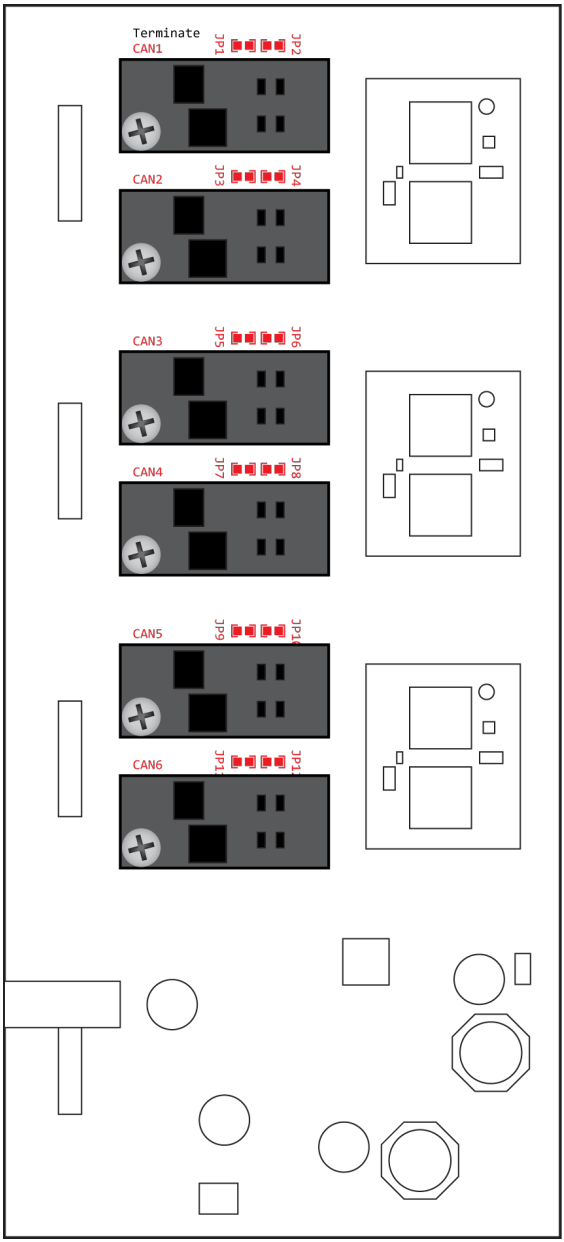
Further notes on termination with terminating resistors can be found in chapter 2.4 *Cabling*.

2.3.1 Activate Internal Termination

Risk of short circuit! Soldering on the CAN interface may only be performed by qualified electrical engineering personnel.

Attention! Electrostatic discharge (ESD) can damage or destroy components on the card. Take precautions to avoid ESD.

1. Loosen the four Torx screws of the front panel of the case.
2. Remove the front panel including the mainboard .
3. Remove the transceiver module(s) to reach the desired solder field(s). Loosen the screw and pull off the transceiver module.
   The following figure shows the position of the transceiver modules and the solder fields.
4. Set the solder bridge(s) according to the desired settings.
   The following table contains the possible settings.
5. Plug on the transceiver modules and fix each transceiver with the corresponding screw.
6. Insert the board including the mainboard carefully back into the case.
   PCAN-USB X6 with M12 connectors: Make sure that the seal is correctly seated.
7. Fasten the front panel with the four Torx screws.



Top view on the solder fields (red) and transceiver modules (dark grey) of the mainboard

Solder fields:

CAN1: JP1, JP2

CAN2: JP3, JP4

CAN3: JP5, JP6

CAN4: JP7, JP8

CAN5: JP9, JP10

CAN6: JP11, JP12

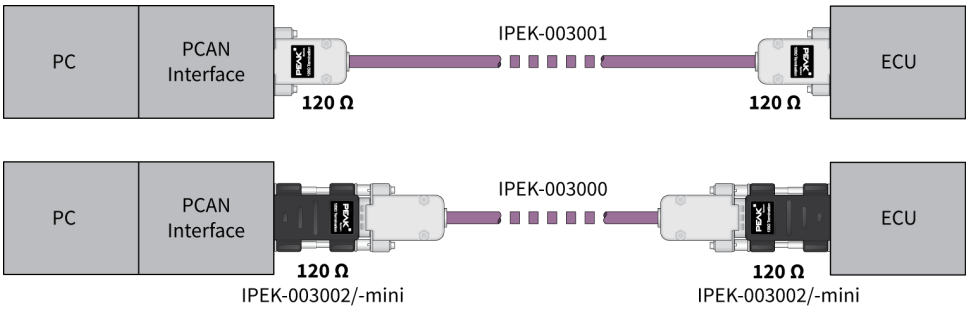
D-Sub/M12 connectors	Solder fields	Internal termination	
		Without (standard)	Aktive
CAN 1	JP1 und JP2		
CAN 2	JP3 und JP4		
CAN 3	JP5 und JP6		
CAN 4	JP7 und JP8		
CAN 5	JP9 und JP10		
CAN 6	JP11 und JP12		

2.4 Cabling

2.4.1 Termination

The High-speed CAN bus (ISO 11898-2) must be terminated with 120 Ω on both ends. The termination prevents interfering signal reflections and ensures the proper operation of the transceivers of the connected CAN nodes (CAN interfaces, control devices).

2.4.2 Example of a Connection



This example shows a connection between the PCAN Interface and a control unit (ECU). The upper example shows a connection with a cable which is terminated with

120 Ω at both ends. At the lower example the connection is made with termination adapters.

2.4.3 Maximum Bus Length

The maximum bus length depends primarily on the bit rate:

Nominal bit rate	Buslength
1 Mbit/s	40 m
500 kbit/s	110 m
250 kbit/s	240 m
125 kbit/s	500 m
50 kbit/s	1.3 km
25 kbit/s	2.5 km

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

3 Installation

This chapter covers the software setup for the CAN interface PCAN-USB X6 under Windows and its connection to the computer.

Note: For installation on Linux, see Appendix D *Linux*.

Install the driver before you connect the CAN interface.

3.1 Install Device Driver Setup

1. Download the device driver setup from our website:
   www.peak-system.com/quick/DL-Driver-E
2. Unpack the file `PEAK-System_Driver-Setup.zip`
3. Double-click the file `PeakOemDrv.exe`
   The driver setup starts.
4. Follow the program instructions.

3.2 Prepare Power Supply

Select a power supply with a nominal voltage between 8 and 30 V DC.

PCAN-USB X6 with D-Sub Connectors

Connect the supplied mating connector to the power supply cable.

PCAN-USB X6 with M12 Connectors

Connect the supplied power cable to the power supply.

3.3 Connect the PCAN-USB X6

1. Connect the power supply to the PCAN-USB X6.
2. Connect the PCAN-USB X6 to a USB port on the computer or to a USB hub.
   Windows detects the new hardware and completes the driver installation.

3. Check the LEDs of the CAN channels on the PCAN-USB X6.
   If the LEDs are green, then the driver was initialized successfully.

Malfunction! Do not use a USB extension cable to connect the CAN interface to the computer. Extension cables does not comply with the USB specification.

3.4 Connect the CAN-Bus

Connect a CAN bus to each of one or more CAN ports.

3.5 Example Application under Windows

As an example application for accessing the CAN interface, run the CAN monitor PCAN-View from the Windows Start menu.

4 Operation

4.1 Status LEDs

CAN channels

The status LEDs of the six CAN channels can assume the following states:

Status	Meaning
Green on	There's a connection to a driver of the operating system.
Green slow blinking	A software application is connected to the CAN channel.
Green quick blinking	Data is transmitted via the connected CAN bus.
Red blinking	An error is occurring during the transmission of CAN data.
Orange quick blinking	Identification of a channel by the PCAN-View software.

USB Upstream

> The status LED of the USB upstream is only lit, when it is connected to a USB 2.0 port or higher.

The status LEDs of the USB upstream can assume the following states:

Status	Meaning
Green on	A power supply and a connection via the USB upstream exist. The device is ready for use.
Orange on	There is only a connection via the USB upstream. The device is not ready for use.

power Supply

The status LED of the power supply can assume the following states:

Status	Meaning
Green on	A power supply is connected.

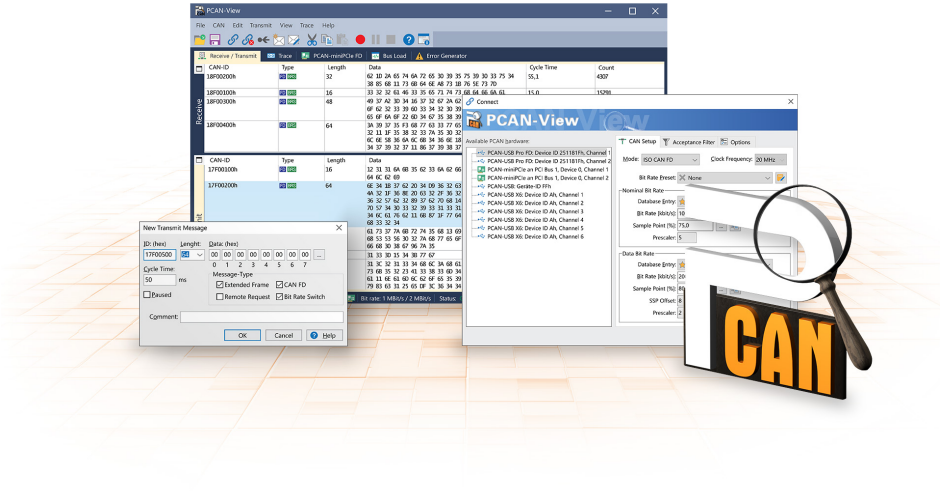
4.2 Unplugging the USB Connection

On Windows, the icon for removing hardware safely is not used with the PCAN-USB X6. You can unplug the PCAN-USB X6 from the computer without any preparation.

4.3 Distinguishing Several PCAN-USB X6

You can operate several PCAN-USB X6 on a single computer at the same time. The supplied program PCAN-View allows the assignment of device IDs in order to distinguish the several CAN interfaces in a software environment.

5 CAN Monitor PCAN-View



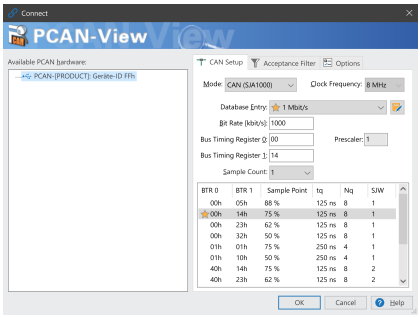
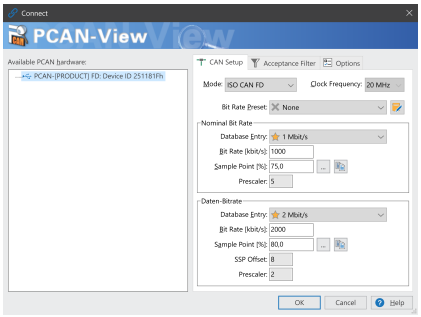
The CAN monitor PCAN-View is a Windows software for viewing, sending, and recording CAN and CAN FD messages. The software is installed with the installation of the device driver package under Windows.

In the following the initialization of a CAN interface is described as an example.

Detailed information about using PCAN-View can be found in the program window under the menu item *Help*.

5.1 CAN interface initialize

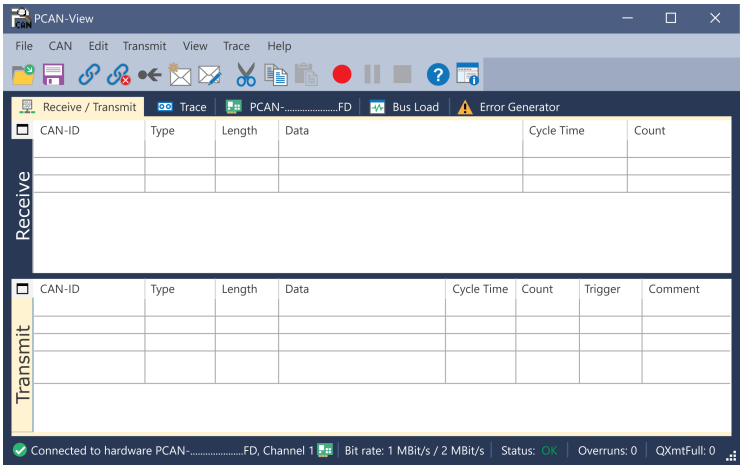
1. Open the program *PCAN-View* via the Windows Start menu.
   Depending on the CAN interface the *Connect* dialog is displayed with or without settings for CAN FD.

CAN	CAN FD
	

CAN interface	List entry in *Available Hardware*
USB Interface, 1-channel	see example above
USB Interface, 2-channel	PCAN-USB Pro FD: Device ID 251181Fh, Channel 1 PCAN-USB Pro FD: Device ID 251181Fh, Channel 2
PCIe Interface, 2-channel	PCAN-PCI Express at PCI Bus 1, Device 0, Channel 1 PCAN-PCI Express at PCI Bus 1, Device 0, Channel 2

2. If there are several CAN interfaces, select the desired interface. For multiple channels, select the desired channel from the list.
3. Enter the *bit rate(s)* and other settings according to the connected CAN bus.

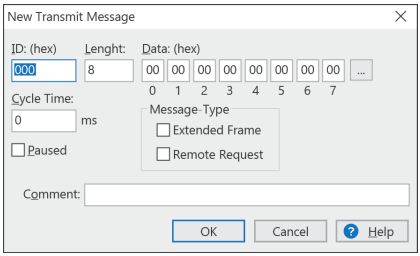
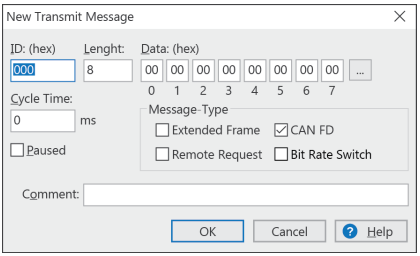
4. Confirm the entries with *OK*. The main window appears and displays the *Receive / Transmit* tab.



5. For initializing another channel or CAN interface, open another instance of *PCAN-View*.

5.2 Transmit CAN message

1. Select the menu command *Transmit / New Message*.
   Depending on the CAN interface, the dialog box *New Transmit Message* is displayed with or without settings for CAN FD.

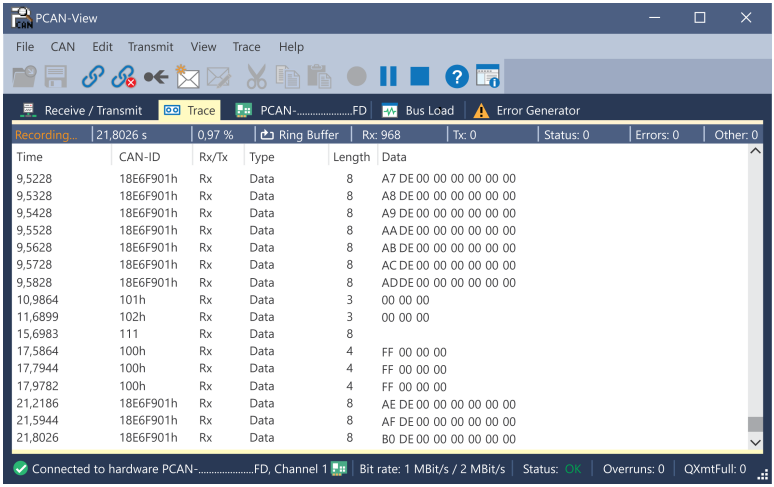
CAN	CAN FD
	

1. Enter the *ID*, *Length* and *Data* of the message. Other settings can be made according to the connected CAN bus.
2. Enter a value into the *Cycle Time* field to choose manually or periodically message transmission.
   Enter a value greater than 0 to transmit periodically.
   Enter the value 0 to transmit only manually.
3. Confirm the entries with *OK*.
   The created transmit message appears on the *Receive / Transmit* tab.
4. To send the message manually, select the menu command *Transmit* > *Send* or press the space bar.
   The manual transmission process is performed additionally for periodically transmitted CAN messages.

5.3 Additional Tabs

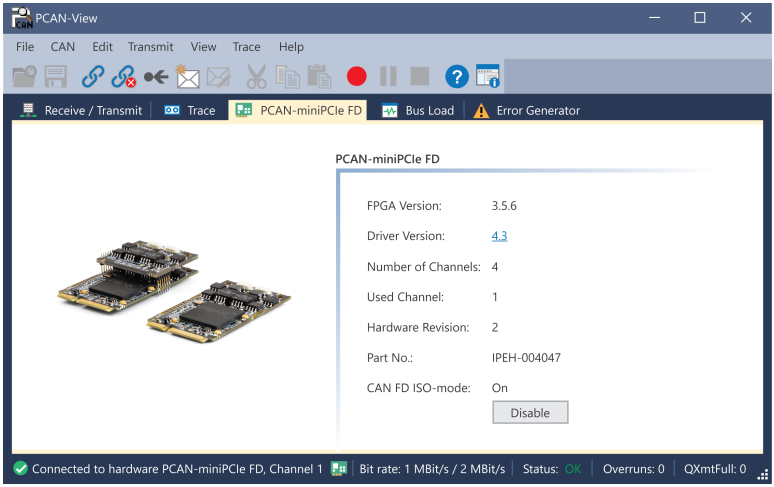
Depending on the CAN interface, additional tabs are available.

5.3.1 Trace Tab



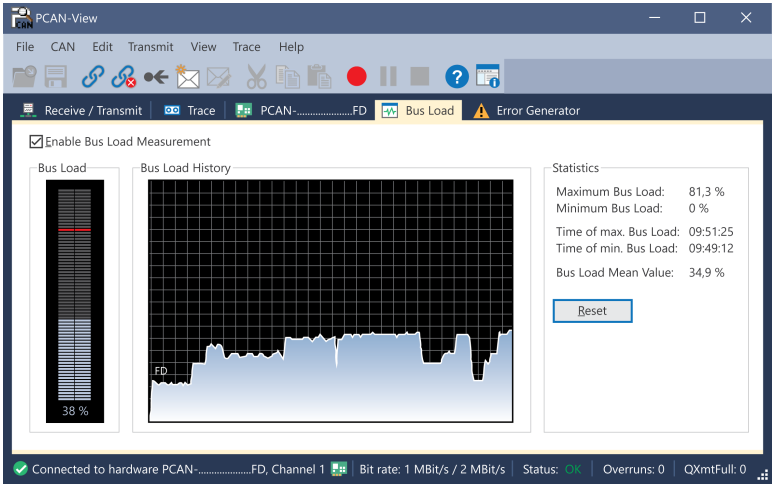
The tracer (data logger) records the communication of the CAN bus in linear or ring buffer mode. The trace data can be saved to a file.

5.3.2 CAN interface Tab



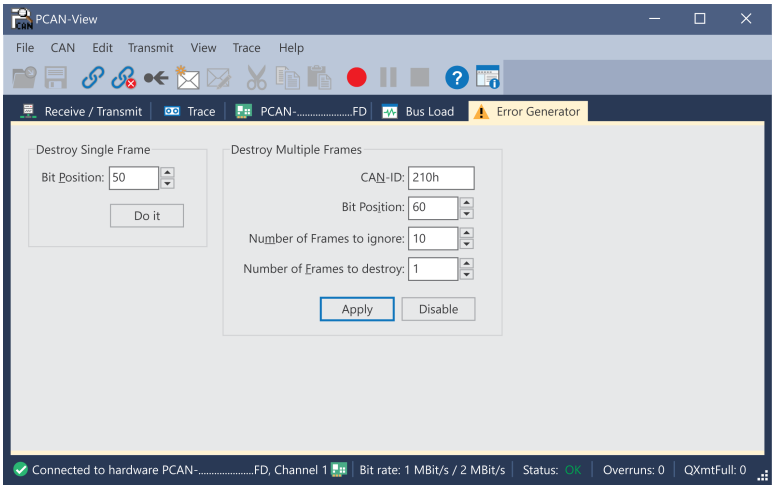
The *CAN interface* tab shows information about the hardware and the used Windows device driver. In this case exemplary for the PCAN-miniPCIe FD. Depending on the CAN interface, a hardware ID can be determined to distinguish several interfaces of the same type. For interfaces with CAN FD a transmission according to "ISO" or "Non-ISO" can be set as default of the hardware.

5.3.3 Bus Load Tab



The *Bus Load* tab displays the current bus load, its time history and statistical information of the connected CAN channel.

5.3.4 Error Generator Tab



Via the *Error Generator* tab the communication on the CAN bus in test environments or during the development of CAN buses can be disturbed in a controlled way by 6 consecutive dominant bits. This is a violation of the CAN protocol on the CAN bus which must be recognized as an error by the connected CAN nodes.

> **Note:** The Error Generator should only be used by experienced users and in the development environment. For further information, please contact our customer support: support@peak-system.com

You can destroy CAN frames with the error generator by one of two methods:

- once after activation
- repeatedly at specific intervals related to a CAN ID

Destroy Single CAN Frame

The *Destroy Single Frame* area refers to the next CAN frame that is recognized by the plug-in card after activation.

1. Enter the *Bit Position* where in the CAN frame the error is to be generated. The bit position must start after the identifier. The count includes the stuff bits.
2. Execute the destroy action with *Do it*.
   The next received or transmitted CAN frame will be destroyed at the selected bit position.

Destroy Multiple CAN Frames

1. Enter the *CAN ID* of the CAN frame that is intended to be destroyed multiple times. The following specifications refer to this ID.
2. Enter the *Bit Position* where in the CAN frame the error is to be generated. The bit position must start after the identifier. The count includes the stuff bits.
3. If CAN messages are to be sent unharmed before being destroyed, specify the *Number of Frames to ignore*.
4. Determine the *Number of Frames to destroy*.
5. Confirm the entries with *Apply* to activate the error generator.
6. Stop destroying further CAN frames with *Disable*.

6 API PCAN-Basic

The intended use of PCAN-Basic requires compliance with the license rights. Read the license agreement for end users at: https://www.peak-system.com/quick/eula

The programming interface (API) PCAN-Basic provides basic functions for the connection of own programs to the CAN interface of PEAK-System. PCAN-Basic is the interface between the program and the device driver. In Windows operating systems this is a DLL (Dynamic Link Library) and in Linux operating systems an SO (Dynamic Shared Object). PCAN-Basic is designed to be cross-operating system compatible. Software projects can be ported between supported systems with little effort.

With the installation of the device driver package under Windows the DLL files of the API PCAN-Basic are placed in the system folder. Examples for all common programming languages as well as libraries and help files are available as download package at: www.peak-system.com/quick/DL-Develop-E

For Linux a download of the API is available under this link. For a use of PCAN-Basic another driver package with chardev driver is needed, because an access under SocketCAN is not possible. The "Driver Package for Proprietary Purposes", the user manual, and further information about the implementation can be found at www.peak-system.com/linux

6.1 Features of PCAN-Basic

- Thread-safe API for developing applications with CAN and CAN FD connections
- Supports CAN specifications ISO 11898-1 for CAN and CAN FD
- Supports the operating systems:
  - Windows® 11 (64 bit), 10 (32/64 bit)
  - Linux (32/64-bit)
- Multiple PEAK-System applications and your own can be operated on a physical channel at the same time
- Single DLL (Win) / SO (Linux) for all supported hardware types
- Use of up to 16 channels for each hardware type
- Simple switching between channels
- Access to the CAN channels of a PCAN-Gateway via the PCAN-LAN device type
- Driver-internal buffering under Windows of up to 32,768 CAN messages per CAN channel
- Precision of time stamps on received messages up to 1 µs (depending on the PEAK CAN interface used)
- Supports PEAK-System‘s trace formats v1.1 for CAN and v2.0 for CAN FD applications
- Access to specific hardware parameters, such as Listen-only mode
- Notification of the application through Windows events when a message is received
- Support of CAN error frames
- Confirmation of physical transmission by CAN echo frames
- Extended system for debugging operations

- Multilingual debugging output
- Output language depends on operating systems
- Debugging information can be defined individually

6.2 Principle Description of the API

The sequence of accessing the CAN interface is divided into three phases:

Initialization

A CAN channel must be initialized before using it. This is done by the simple call of the function `CAN_Initialize` for CAN and `CAN_InitializeFD` for CAN FD. Per CAN interface type the API allows the simultaneous use of up to 16 CAN channels. After a successful initialization the CAN channel is ready. No further configuration steps are required.

Interaction

For receiving and transmitting messages the functions `CAN_Read` and `CAN_Write` as well as `CAN_ReadFD` and `CAN_WriteFD` are available depending on the initialization mode. Additional settings can be made, such as setting up message filters to confine to specific CAN IDs or setting the CAN controller to Listen-only mode.

For the receiving CAN messages, events can be configured for automatic notification of an application (client). This offers the following advantages:

- The application no longer needs to check for received messages periodically (no polling).
- The response time at reception is reduced.

Completion

To end the communication the function `CAN_Uninitialize` is called in order to release the reserved resources for the CAN channel, among others. In addition the CAN channel is marked as "Free" and is available to other applications.

7 Technical Data

Connectors (PCAN-USB X6 with D-Sub Connectors)	
CAN	6 x D-Sub male panel connector, 9-pin Pin assignment according to specification CiA® 303-1
USB Upstream	USB plug type A; High-speed USB 2.0 (compatible with USB 1.1 and USB 3.0)
USB Downstream	USB female panel connectors type A; High-speed USB 2.0 (compatible with USB 1.1 and USB 3.0); max. 500 mA current output
Power	Phoenix mating connector, 2-pole, pitch 3.81 mm (Phoenix Contact MC1,5/2-STF-3.81 – 1827703)

Connectors (PCAN-USB X6 with M12 Connectors)	
CAN	6 x M12 (m) male panel connectors, 5 pins, Pin assignment according to specification CiA® 303-1, Manufacturer: Phoenix, Type: SACC-DSI-MS-5CON-M12-SCO SH, Connection distance requires 18 mm connector housings
USB Upstream	USB port type Mini-B, High-Speed-USB 2.0 (compatible with USB 1.1 and USB 3.0)
Power	Phoenix M12 female panel connectors, 4-pole, a-coded

CAN (FD)		
Protocols on OSI layer 2	CAN and CAN FD according to ISO 11898-1; non-ISO CAN FD	
Physical transmission, OSI layer 1	ISO 11898-2 (High-speed CAN)	
Transceiver	NXP TJA1044GT	
CAN bit rates	Nominal:	25 kbit/s up to1 Mbit/s
CAN-FD bit rates	Nominal: Data:	25 kbit/s up to 1 Mbit/s 25 kbit/s up to 12 Mbit/s
Controller	FPGA implementation	
Time stamp resolution	1 µs	
Galvanic isolation (IPEH-004063/-64 only)	up to 300 V, separate for each CAN connector	
Internal Termination	via solder bridges, disabled at delivery	

Power supply		
Supply voltage	8 to 30 V DC	
Power consumption without USB device on the USB downstream	Power: USB upstream:	max. 350 mA bei 12 V DC 0 mA

Maße		
Size (W x L x H)	with D-Sub connectors: with M12 connectors:	170 x 93 x 65 mm (withoutKabel) 170 x 103 x 65 mm
USB upstream cable length	with D-Sub connectors: with M12 connectors:	1.5 m 2 m
Power supply cable length (IPEH-004063 only)	5 m	
Weight (without cable)	550 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
Ingress protection (IEC 60529)	IP20 for IPEH-004062 and IPEH-004064 IP64 for IPEH-004063

Conformity	
RoHS	Directive 2011/65/EU (RoHS 2) + 2015/863/EU DIN EN IEC 63000:2019-05;VDE 0042-12:2019-05
EMV	Directive 2014/30/EU EN 55024:2016-05;VDE 0878-24:2016-05 EN 55032:2016-02;VDE 0878-32:2016-02

Appendix A CE Certificate

EU Declaration of Conformity

This declaration applies to the following product:

Product name: **PCAN-USB X6**

Item number(s): **IPEH-004062/63/64**

Manufacturer: PEAK-System Technik GmbH
Otto-Roehm-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;VDE 0042-12:2019-05
Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances (IEC 63000:2016); German version EN 63000:2018

EU Directive 2014/30/EU (Electromagnetic Compatibility)

DIN EN 55024:2016-05;VDE 0878-24:2016-05
Information technology equipment – Immunity characteristics – Limits and methods of measurement (CISPR 24:2010 + Cor.:2011 + A1:2015); German version EN 55024:2010 + A1:2015

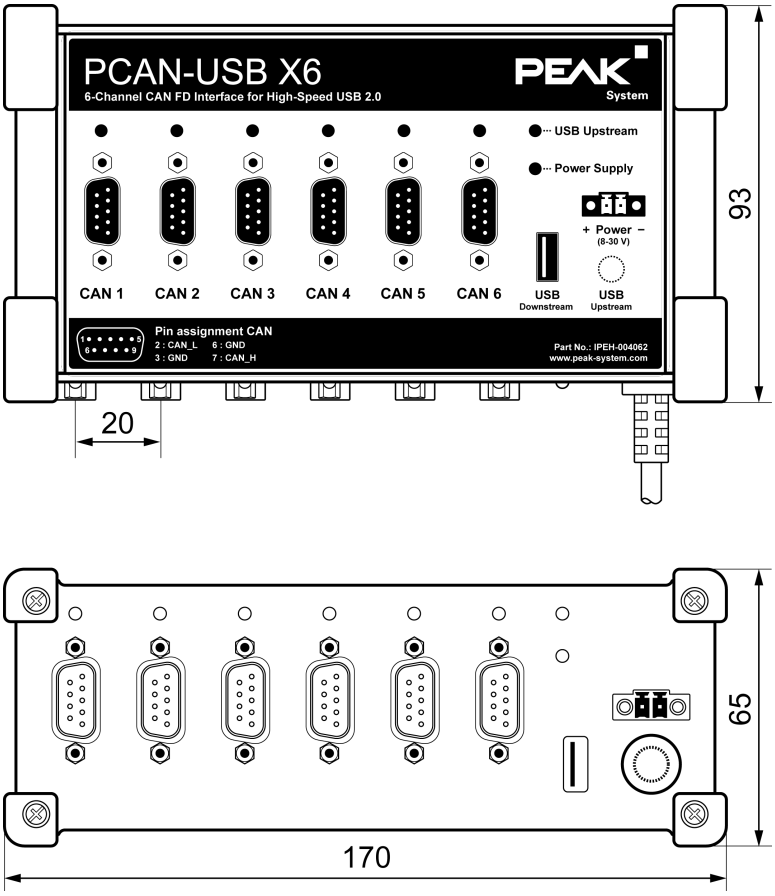
DIN EN 55032:2016-02;VDE 0878-32:2016-02
Electromagnetic compatibility of multimedia equipment - Emission Requirements (CISPR 32:2015); German version EN 55032:2015

Darmstadt, 08.03.2021

Uwe Wilhelm, Managing Director

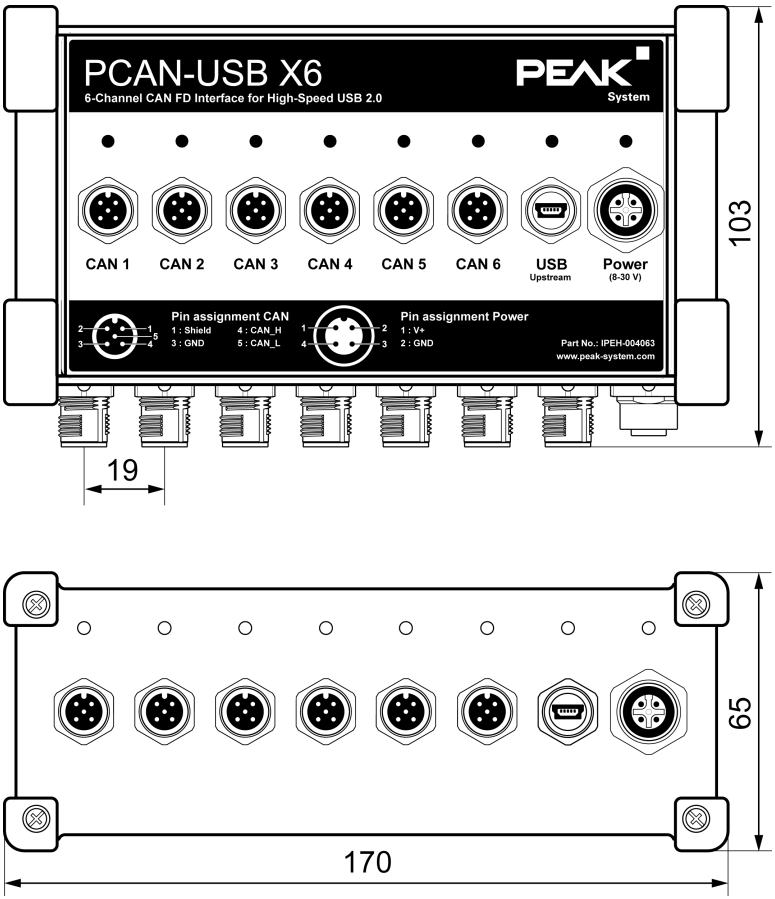
Appendix B Dimension Drawings

PCAN-USB X6 with D-Sub Connectors



Dimensions in mm.

PCAN-USB X6 with M12 Connectors



Dimensions in mm.

Appendix C Quick Reference

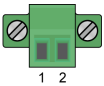
Note: The scope of supply does not contain a power supply unit for the device. There is no supply via the USB connection to the PC.

Software/Hardware Installation under Windows

Download the device drivers installation package from our website www.peak-system.com/quick/DL-Driver-E. Install the driver before you install the CAN interface.

Malfunction! Do not use a USB extension cable to connect the PCAN-USB X6 to the computer.

After that, you connect the PCAN-USB X6 to a power supply and to a USB port of the computer. Windows detects the new hardware and initializes the driver. The CAN LEDs of the adapter light green now.

Accessories (scope of delivery)	PCAN-USB X6 M12 connector	PCAN-USB X6 D-Sub
Power supply		
USB upstream		Direct connection

Getting Started under Windows

Run the CAN monitor PCAN-View from the Windows Start menu as a sample application for accessing the CAN interface. For initialization of the CAN interface select the desired CAN channel and CAN bit rate.

LEDs

Status CAN channels	Meaning
Green on	There's a connection to a driver of the operating system.
Green slow blinking	A software application is connected to the CAN channel.
Green quick blinking	Data is transmitted via the connected CAN bus.
Red blinking	An error is occurring during the transmission of CAN data.
Orange quick blinking	Identification of a channel by the PCAN-View software.

Status USB upstream	Meaning
Green on	A power supply and a connection via the USB upstream exist. The device is ready for use.
Orange on	There is only a connection via the USB upstream. The device is not ready for use.

Note: The status LED of the USB upstream is only lit, when it is connected to a USB 2.0 port or higher.

Appendix D Linux

Depending on the Kernel version, device drivers for the CAN interfaces from PEAK-System are already included in the operating system. The CAN interfaces are treated as network devices (SocketCAN, netdev). You can find the documentation for SocketCAN under: https://www.kernel.org/doc/Documentation/networking/can.txt

The command `grep PEAK_ /boot/config-`uname -r`` lists the available drivers. The following table shows the PCAN-Interfaces and from which kernel version they are supported.

PCAN-Interface			Kernel version
PCAN-PCI	PCAN-PCI Express	PCAN-miniPCI	≥ 3.2
PCAN-PC/104-Plus	PCAN-PCI/104-Express		
PCAN-USB	PCAN-USB Pro	PCAN-ExpressCard	≥ 3.4
PCAN-PCI Express	PCAN-miniPCIe		
PCAN-PCI/104-Express			≥ 3.7
PCAN-USB FD	PCAN-USB Pro FD		≥ 4.0
PCAN-Chip USB			≥ 4.11
PCAN-PCI Express FD			≥ 4.12
PCAN-PCI/104-Express FD	PCAN-miniPCIe FD	PCAN-Chip PCIe FD	≥ 4.12
PCAN-M.2			
PCAN-Chip PCIe			≥ 4.3
PCAN-USB X6			≥ 4.9

Whether the required driver for the PCAN-Interface is present and loaded can be checked with the following command: `lsmod | grep ^peak_check`. If the initialization was successful, the response line starts with `peak_usb` or `peak_pci`.

If the required drivers are not listed, install the "Driver Package for Proprietary Purposes". The download, the user manual for the driver, and the corresponding "Implementation Details" can be found under: www.peak-system.com/linux

This driver package is also needed to use the APIs based on the chardev driver, for example PCAN-Basic, libpcan, or libpcanfd.