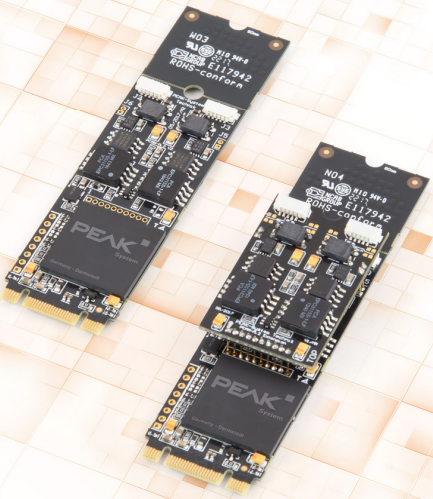
PCAN-M.2

CAN FD Interface for M.2 (PCIe)

User Manual



Document version 1.2.2 (2019-06-21)

Relevant products

Product name	Model	Part number
PCAN-M.2 Single Channel	One CAN channel, galvanic isolation for CAN connection	IPEH-004083
PCAN-M.2 Dual Channel	Two CAN channels, galvanic isolation for CAN connections	IPEH-004084
PCAN-M.2 Four Channel	Four CAN channels, galvanic isolation for CAN connections	IPEH-004085

The cover picture shows the product PCAN-M.2 as Dual Channel (left) and Four Channel (right) version in 2280 format. The Single Channel model has an identical form factor like the Dual Channel version but varies in equipment.

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1 Introduction

The PCAN-M.2 allows the connection of CAN and CAN FD networks via the M.2 interface (PCIe) of modern computer boards. With its small format, the plug-in card is ideal for embedded PCs, single-board computers (SBC), and compact embedded applications. There is a galvanic isolation between the computer and the CAN side up to 300 Volts. The card is available as single, dual and four-channel version.

The new 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 A/B standard, thus CAN FD nodes can be used in existing CAN networks. However, in this case the CAN FD extensions are not applicable.

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 the new standard CAN FD.

Tip: At the end of this manual (Appendix C) you can find a Quick Reference with brief information about the installation and operation of the PCAN-M.2 card.

1.1 Properties at a Glance

- CAN interface for the M.2 slot (uses PCIe lane)
- 1, 2 or 4 High-speed CAN channels (ISO 11898-2)
- Form factor M.2 type: 2280/2260-B-M; Height: Single and Dual Channel 4.6 mm, Four Channel 10.2 mm; Component height of top side above form factor specification of 1.5 mm
- Complies with CAN specifications 2.0 A/B and FD
- CAN FD support for ISO and Non-ISO standards switchable
- CAN FD bit rates for the data field (64 bytes max.) from 20 kbit/s up to 12 Mbit/s
- CAN bit rates from 20 kbit/s up to 1 Mbit/s
- CAN bus connection via connection cable and D-Sub, 9-pin (in accordance with CiA® 303-1)
- FPGA implementation of the CAN FD controller
- MCP2558FD CAN transceiver
- Galvanic isolation on the CAN connection up to 300 V, separate for each CAN channel
- CAN termination can be activated through a solder jumper, separately for each CAN channel
- PCIe data transfer via bus master DMA
- DMA memory access operations with 32- and 64-bit addresses
- Measurement of bus load including error frames and overload frames on the physical bus
- Induced error generation for incoming and outgoing CAN messages
- Extended operating temperature range from -40 to 85 °C (-40 to 185 °F)

Note: This manual describes the use of the PCAN-M.2 card with **Windows**. You can find device drivers for **Linux** and the corresponding application information on the provided DVD in the `Develop` directory branch and on our website under www.peak-system.com/linux.

1.2 System Requirements

- A vacant M.2 slot in the computer (specification 1.x)
- Operating system Windows 10, 8.1, 7 (32/64-bit) or Linux (32/64-bit)

1.3 Scope of Supply

- PCAN-M.2 card
- Connection cable including D-Sub plug for each channel
- Device drivers for Windows 10, 8.1, 7 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
- Manual in PDF format

2 Installing the Software and the Card

This chapter covers the software setup for the PCAN-M.2 card in Windows and the installation of the card in the computer.

Install the driver before you install the card.

- Do the following to install the driver:

  1. Start `Intro.exe` from the supplied DVD.

     The navigation program starts.
  2. In the main menu, select **Drivers** and click on **Install now**.
  3. Confirm the message of the User Account Control related to "Installer database of PEAK Drivers".

     The driver setup starts.
  4. Follow the program instructions.

- Do the following to install the card:

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

  1. Shut down the computer.
  2. Disconnect the computer's power supply.
  3. Open the computer case.
  4. Insert the PCAN-M.2 card into an empty M.2 slot.

     If you do not have an M.2-**2280** slot, you can shorten the card to **2260** format. To do this, carefully break the back of the card along the predetermined breaking point.

5. For each CAN channel, mount a D-Sub connector with connection circuit board into a respective hole of the computer casing.
6. For each CAN channel interconnect a D-Sub connector and the corresponding port on the PCAN-M.2 card.
7. Close the computer case.
8. Reconnect the computer power supply.
9. Turn on the computer and start Windows.

Windows detects the new hardware and completes the driver installation.

Do the following to check the operational readiness:

1. Open the Windows Start menu.
2. Type `peakcpl` and press Enter.

The information window for PEAK hardware appears. The plug-in card must be displayed in the table on the **CAN Hardware** tab.

3 Connecting the CAN Bus

3.1 Connection over D-Sub Connector

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.

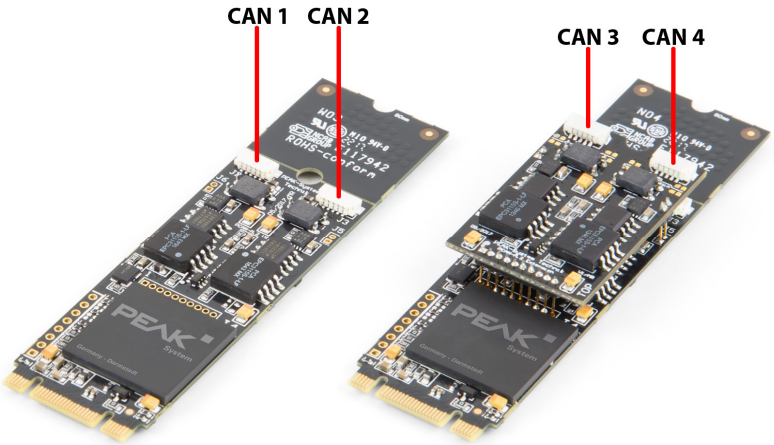


Figure 1: Positions of the CAN ports on the PCAN-M.2 card;
left dual channel **(IPEH-004084)** and right four-channel card **(IPEH-004085)**;
for the single channel card **(IPEH-004083)** only CAN 1 is present

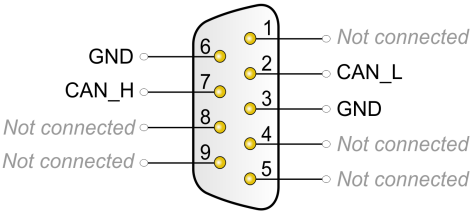


Figure 2: Pin assignment of High-speed CAN;
male connector on the card

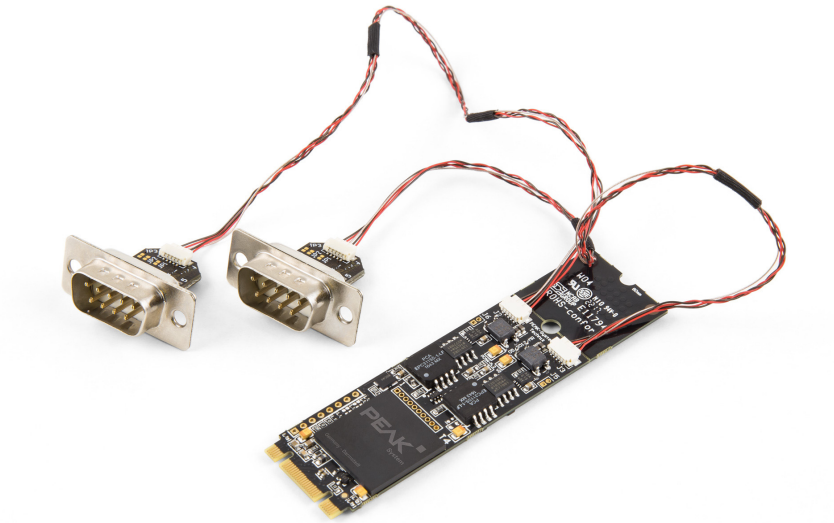


Figure 3: PCAN-M.2 Dual Channel card with connection cables

To connect a CAN bus to the PCAN-M.2 card, use the supplied special connection cables. After you've plugged in the cable on the card, you can connect a CAN bus to the D-Sub connector.

The pin assignment between the D-Sub connector and the 5-pin connector[1] on the PCAN-M.2 card is as follows:

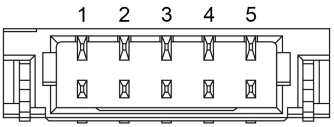


Figure 4: Front view of a CAN connector (SUR)
on the PCAN-M.2 card (CAN 1 to 4)

[1] Connector type SUR from JST (www.jst-mfg.com),
name of the matching plug: SM05B-SUR-TF

Pin SUR	Function	Pin D-Sub
1	Not connected	-
2	Not connected	-
3	GND	3, 6
4	CAN_H	7
5	CAN_L	2

3.2 Activating the Daisy Chain

The daisy chain can be activated via solder jumpers on the board to connect a CAN FD optimized connection to an existing CAN bus. This makes interference-free operation possible at higher CAN FD bit rates, because stubs and Y distributions are largely avoided.

When the daisy chain is activated, the pin assignment changes as follows:

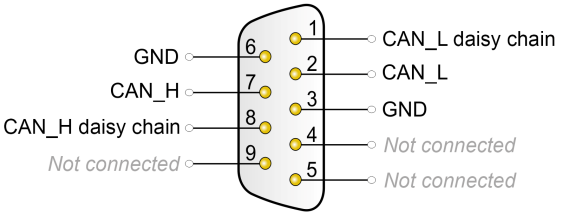


Figure 5: Pin assignment of High-speed CAN and daisy chain; male connector on the card

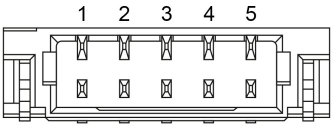


Figure 6: Front view of a CAN connector (SUR) on the PCAN-M.2 card (CAN 1 to 4)

Pin SUR	Function	Pin D-Sub
1	CAN_H daisy chain	8
2	CAN_L daisy chain	1
3	GND	3, 6
4	CAN_H	7
5	CAN_L	2

Do the following to activate the daisy chain:

Risk of short circuit! Solder with great care to avoid unwanted short circuits on the card.

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

Set the solder bridges corresponding to the desired settings.

Figure 7 on page 14 shows the positions of the solder fields on the bottom side of the card **(IPEH-004083/84/85)**. The table beside contains the possible settings.

Figure 8 on page 15 shows the positions of the solder fields on the top side of the extension card of the four-channel card **(IPEH-004085)**. The table below contains the possible settings.

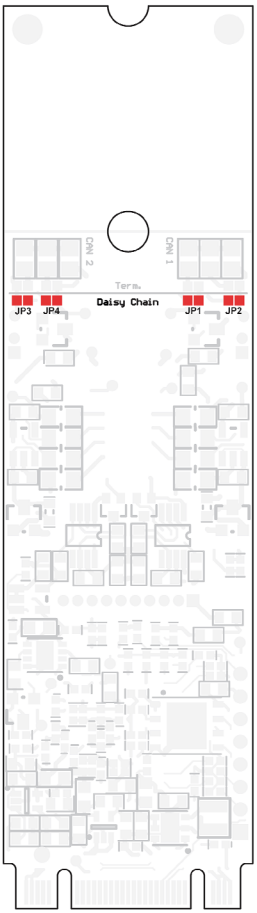


Figure 7: Positions of the solder fields on the bottom side of the card **(IPEH-004083/84/85)** for the activation of the daisy chain

D-Sub connector	Solder fields	Daisy chain	
		Without (standard)	Active
CAN 1	JP1 and JP2		●
CAN 2	JP3 and JP4		●

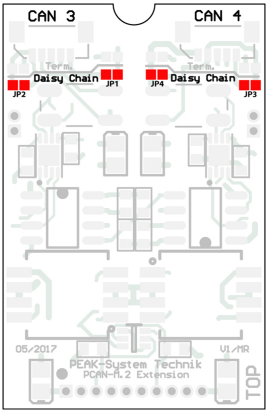


Figure 8: Position of the solder fields on the top side of the expansion card of the four-channel card **(IPEH-004085)** for the activation of the daisy chain

D-Sub connector	Solder fields	Daisy chain	
		Without (standard)	Active
CAN 3	JP1 and JP2		⬭
CAN 4	JP3 and JP4		⬭

3.3 Activating the Internal Termination

The internal termination can be activated by solder jumpers on the board to terminate one end of the CAN bus with 120 Ohms. At delivery the termination is not activated. A High-speed CAN bus (ISO 11898-2) must be terminated on both ends with 120 Ohms. Otherwise disturbances may arise.

➥ Do the following to activate the internal termination:

Risk of short circuit! Solder with great care to avoid unwanted short circuits on the card.

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

Set the solder bridges corresponding to the desired settings.

Figure 9 on page 17 shows the positions of the solder fields on the bottom side of the card **(IPEH-004083/84/85)**. The table beside contains the possible settings.

Figure 10 on page 18 shows the positions of the solder fields on the top side of the extension card of the four-channel card **(IPEH-004085)**. The table below contains the possible settings.

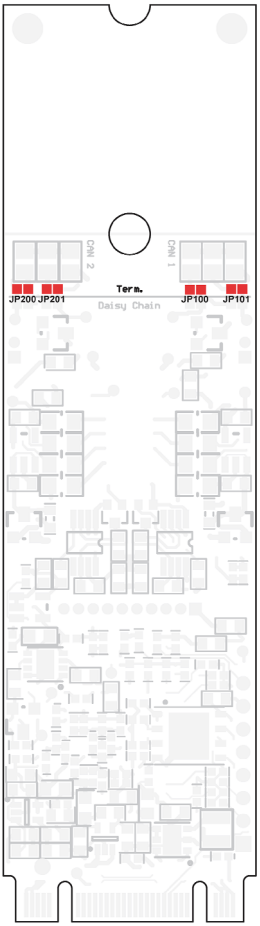


Figure 9: Positions of the solder fields on the bottom side of the card (IPEH-004083/84/85) for the activation of the internal termination

D-Sub connector	Solder fields	Internal termination	
		Without (standard)	Active
CAN 1	JP100 and JP101		●
CAN 2	JP200 and JP201		●

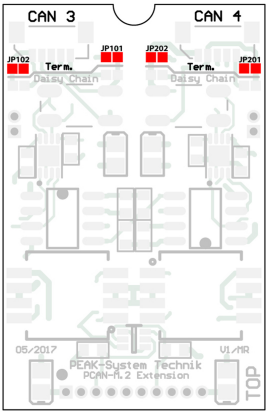


Figure 10: Position of the solder fields on the top side of the expansion card of the four-channel card **(IPEH-004085)** for the activation of the internal termination

D-Sub connector	Solder fields	Internal termination	
		Without (standard)	Active
CAN 3	JP101 and JP102		●
CAN 4	JP201 and JP202		●

3.4 Cabling

3.4.1 Termination

The High-speed CAN bus (ISO 11898-2) must be terminated with 120 ohms at 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).

The PCAN-M.2 card has an optional internal termination with 120 ohms. For more information, see chapter 3.3.

3.4.2 Example of a Connection

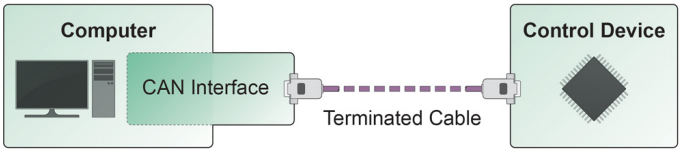


Figure 11: Simple CAN connection

This example shows a connection between the PCAN-M.2 card and a control unit. The connection cable is terminated with 120 ohms at both ends.

3.4.3 Maximum Bus Length

High-speed CAN networks have bit rates up to 1 Mbit/s. The maximum bus length primarily depends on the bit rate.

The following table shows different maximum possible CAN bus length with different bit rates:

Bit rate	Bus length
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
20 kbit/s	3.3 km

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

Note: For CAN FD, the same maximum bus lengths apply as for CAN, despite the higher data bit rate of CAN FD.
The dependency is based on the bit rate during the arbitration, called nominal bit rate. The nominal bite rate at CAN FD can be up to 1 Mbit/s.

4 Software and API

This chapter covers the provided software PCAN-View and the programming interface PCAN-Basic.

4.1 Monitor Software PCAN-View

PCAN-View is simple Windows software for viewing, transmitting, and logging CAN and CAN FD messages.

Note: This chapter describes the use of PCAN-View with a CAN FD card.

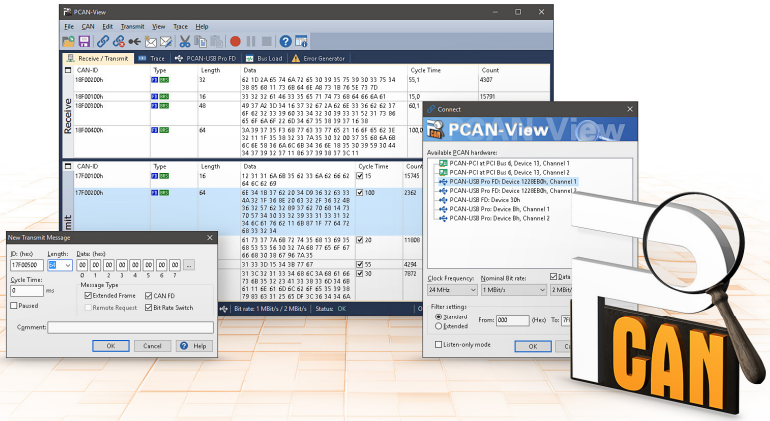


Figure 12: PCAN-View for Windows

Do the following to start and initialize PCAN-View:

1. Open the Windows Start menu and select **PCAN-View**.

   The **Connect** dialog box appears.

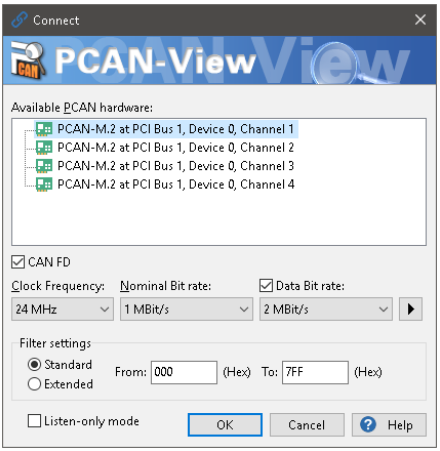


Figure 13: Selection of the hardware and parameters

2. Select an interface from the list.
3. From the drop-down menu, choose a **Clock Frequency**. The selectable bit rates in the following are based on this setting.
4. From the drop-down list, select a **Nominal Bit rate**, which is used for the arbitration phase (max. 1Mbit/s).
5. Enable the **Data Bit Rate** checkbox.
6. From the drop-down menu, choose an additional **Data Bit rate** for the CAN FD bus. The bit rate selected here is used to transfer the data fields of a CAN FD frame with a higher bit rate.

Note: Both transmission rates must match those which are used by all nodes on the CAN bus.

Tip: Create custom bit rates by using the arrow button (▸).

7. Under **Filter settings**, you can limit the range of CAN IDs to be received, either for standard frames (11-bit IDs) or for extended frames (29-bit IDs).
8. Activate the **Listen-only mode** if you do not actively participate in the CAN traffic and just want to observe. This also avoids an unintended disruption of an unknown CAN environment (e.g. due to different bit rates).
9. Confirm the settings in the dialog box with **OK**. The main window of PCAN-View appears (see Figure 14)

4.1.1 Receive/Transmit Tab

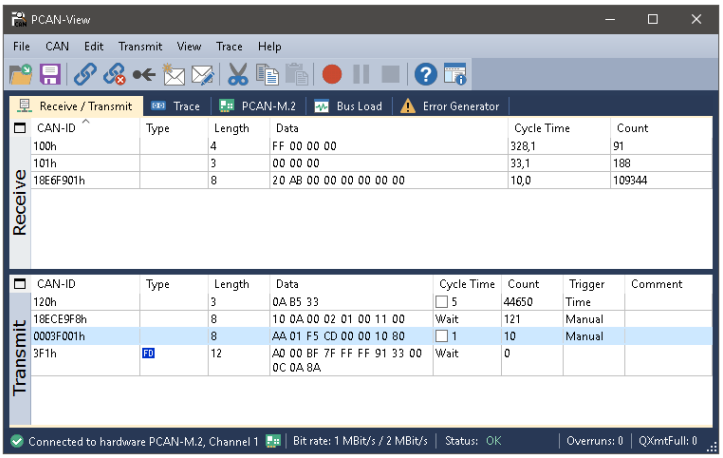


Figure 14: Receive/Transmit tab

The **Receive/Transmit** tab is the main element of PCAN-View. It contains two lists, one for received messages and one for the transmit messages. The CAN data format is hexadecimal by default.

Do the following to transmit one CAN message with PCAN-View:

1. Select the menu command **Transmit** > **New Message** (alternatively or Ins).

   The **New Transmit Message** dialog box appears.

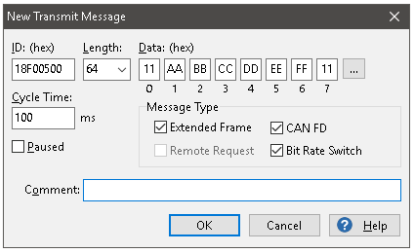


Figure 15: Dialog box New Transmit Message

2. Enable the **CAN FD** checkbox to define a CAN FD message with a maximum **Length** of 64 data bytes.
3. Enter the **ID**, the data **Length,** and the CAN message **Data**. With a length of more than 8 bytes, click on [...] and enter the data bytes into the editor.

Note: With the program version 4 of PCAN-View, the DLC field was renamed to **Length**. Latter reflects the actual data length.

4. 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.
5. Enable the **Bit Rate Switch** checkbox, that the data of a CAN FD message is transmitted with the selected **Data Bit Rate**.
6. Confirm the entries with **OK**.

   The created transmit message appears on the **Receive/Transmit** tab.
7. Trigger selected transmit messages manually with the menu command **Transmit** > **Send** (alternatively [Space] bar). The manual transmission for CAN messages being transmitted periodically is carried out additionally.

Tip: Under the menu command **File > Save,** you can save the current transmit messages into a transmit list. Saved transmit lists are available for reuse.

4.1.2 Trace Tab

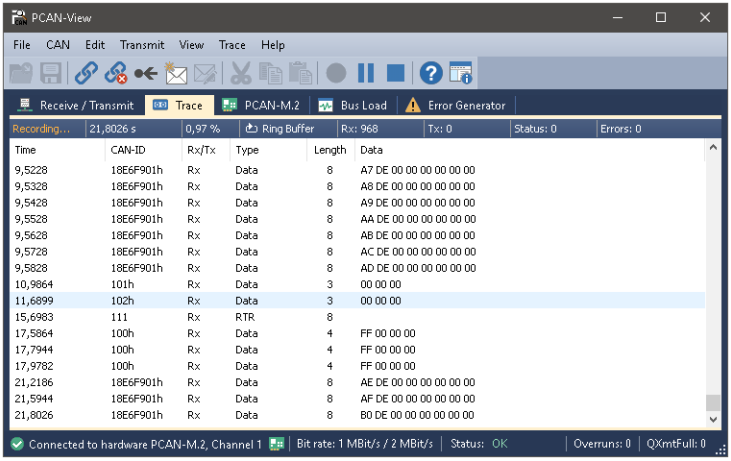


Figure 16: Trace tab

On the **Trace** tab, the data tracer (data logger) of PCAN-View is used for logging the communication on a CAN bus. During this process the messages are cached in the working memory of the PC. Afterwards they can be saved to a file.

The Tracer runs either in linear or in ring buffer mode. The linear buffer mode stops the Tracer as soon as the buffer is full. The ring buffer mode overwrites the oldest messages by new ones as soon as the buffer is full.

4.1.3 PCAN-M.2 Tab

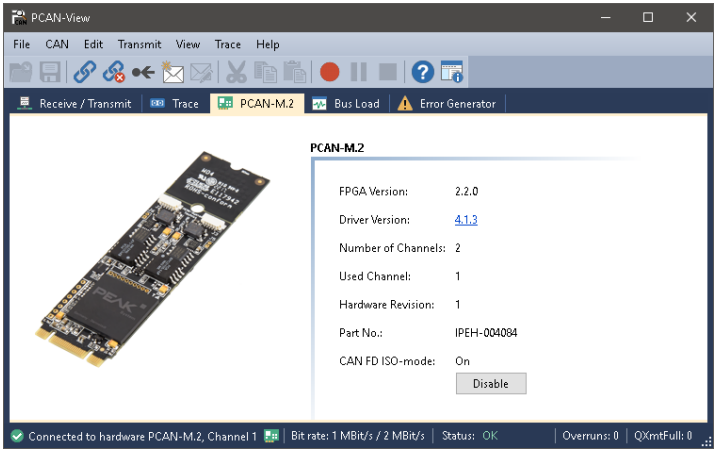


Figure 17: PCAN-M.2 tab

The **PCAN-M.2** tab contains some detailed information about the hardware and driver.

CAN FD ISO-mode

The defined in the ISO 11898-standard is not compatible with the original protocol. PEAK-System takes this into account by supporting both protocol versions with their CAN FD interfaces.

If required, the user can switch to the CAN FD protocol used in the environment with the **Enable** / **Disable** button („Non-ISO“ and „ISO“).

4.1.4 Bus Load Tab

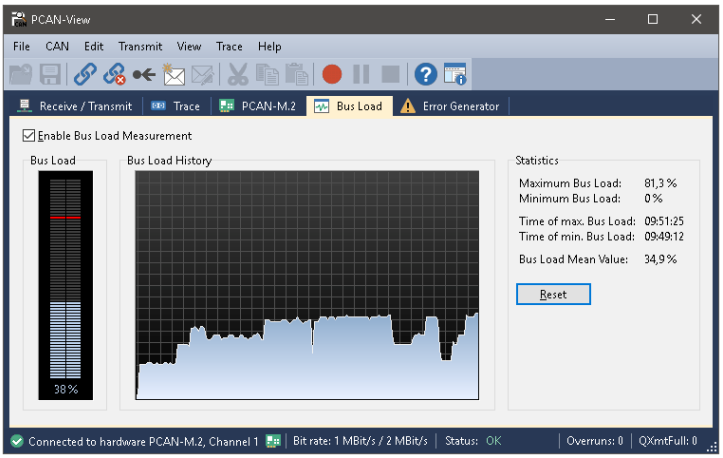


Figure 18: Bus Load tab

On the **Bus Load** tab, the current bus load, time course, and statistical information of the CAN channel are displayed. The CAN bus load reflects the utilization of transmission capacity.

4.1.5 Error Generator Tab

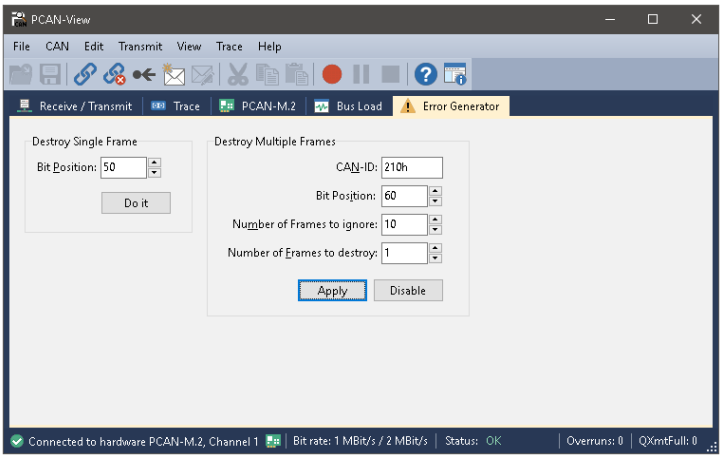


Figure 19: Error Generator tab

Via the **Error Generator** tab, the communication on the CAN bus can be disturbed for testing purposes 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.

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

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

Do the following to destroy a single CAN frame:

1. Enter the **Bit Position** where in the CAN frame the error is to be generated. 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.

The **Destroy Multiple Frames** area refers to a CAN ID whose frames are to be destroyed in specific intervals.

Do the following to destroy multiple CAN frames:

1. Enter the **CAN ID** of the frame to be destroyed.
2. Enter the **Bit Position** where in the CAN frame the error is to be generated. The count includes the stuff bits.
3. The **Number of Frames to ignore** field specifies the number of CAN frames with the given ID that are ignored before a frame is destroyed.
4. The **Number of Frames to destroy** field specifies the number of CAN frames with the given ID that are destroyed consecutively.
5. Confirm the entries with **Apply** to activate the error generator.
6. Stop destroying further CAN frames with **Disable**.

4.1.6 Status Bar

Figure 20: PCAN-M.2 status bar

The status bar shows information about the current CAN connection, about error counters (Overruns, QXmtFull) and shows error messages.

You can find further information about the use of PCAN-View in the help which you can invoke in the program via the **Help** menu or with the F1 key.

4.2 Linking Own Programs with PCAN-Basic Version 4 or Higher

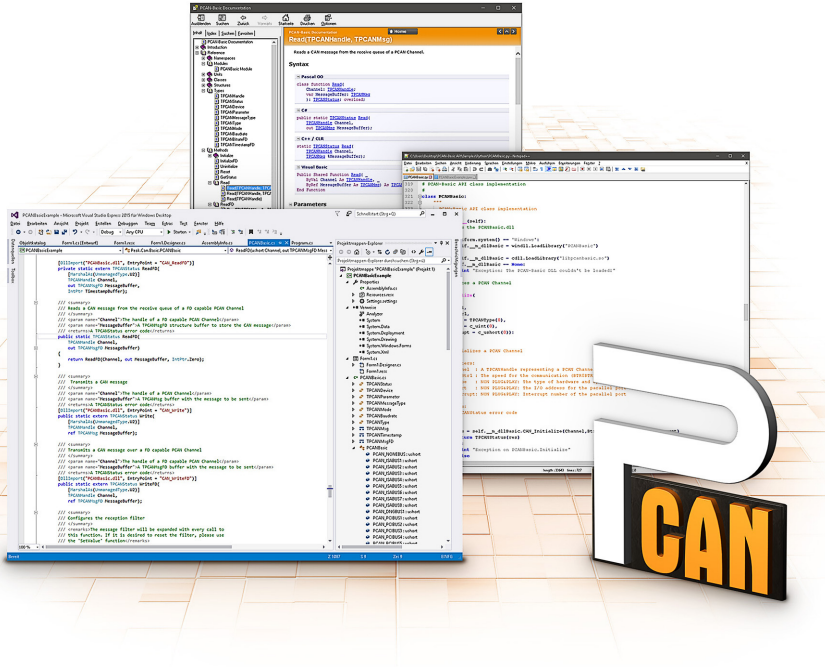


Figure 21: PCAN-Basic

On the provided DVD, you can find files of the PCAN-Basic programming interface in the directory branch `Develop`. This API provides basic functions for linking own programs to CAN and CAN FD interfaces by PEAK-System and can be used for the following operating systems:

- Windows 10, 8.1, 7 (32/64-bit)
- Windows CE 6.x (x86/ARMv4)
- Linux (32/64-bit)

The API is designed for cross-platform use. Therefore, software projects can easily be ported between platforms with low efforts. For all common programming languages, examples are available.

Beginning with version 4, PCAN-Basic supports the new CAN FD standard (CAN with Flexible Data Rate) which is primarily characterized by higher bandwidth for data transfer.

4.2.1 Features of PCAN-Basic

- API for developing applications with CAN and CAN FD connections
- Support for CAN specifications 2.0 A/B and FD
- Supports the operating systems Windows 10, 8.1, 7 (32/64-bit), Windows CE 6.x, and Linux (32/64-bit)
- Multiple PEAK-System applications and your own can be operated on a physical channel at the same time
- Use of a single DLL for all supported hardware types
- Use of up to 16 channels for each hardware type (depending on the PEAK CAN interface used)
- Simple switching between channels of a PCAN PC hardware
- Access to the CAN channels of a PCAN-Gateway via the new PCAN-LAN hardware type
- Driver-internal buffering 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 version 1.1 and 2.0 (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
- Extended system for debugging operations
- Multilingual debugging output
- Output language depends on operating system
- Debugging information can be defined individually
- Thread-safe API

Tip: An overview of the API functions is located in the header files. You can find detailed information about the PCAN-Basic API on the provided DVD in the text and help files (file name extensions .txt and .chm).

4.2.2 Principle Description of the API

The PCAN-Basic API is the interface between the user application and device driver. In Windows operating systems this is a DLL (Dynamic Link Library).

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

1. Initialization
2. Interaction
3. Completion

Initialization

A 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. Depending on the type of the CAN hardware, up to 16 CAN channels can be opened at the same time. 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. Additional settings can be made, e.g. setting up message filters for specific CAN IDs or the listen-only mode for the CAN controller.

When receiving CAN messages, events are used for an 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.

4.2.3 Notes about the License

Device drivers, the interface DLL, and further files needed for linking are property of the PEAK-System Technik GmbH and may be used only in connection with a hardware component purchased from PEAK-System or one of its partners. If a CAN hardware component of third-party suppliers should be compatible to one of PEAK-System, then you are not allowed to use or to pass on the driver software of PEAK-System.

If a third-party supplier develops software based on the PCAN-Basic and problems occur during the use of this software, consult the software provider.

5 Technical Specifications

Connectors	
Computer	M.2 (PCIe) 2280(60), B+M key; 59-pin; electromechanical specifications 1.1
CAN (via cable)	D-Sub (m), 9-pin, Pin assignment according to specification CiA® 303-1
CAN (on card)	Connector type SUR from JST (www.jst-mfg.com), name of the matching plug: SM05B-SUR-TF

CAN	
Protocols	CAN FD ISO 11898-1:2015, CAN FD non-ISO, CAN 2.0 A/B
Physical transmission	ISO 11898-2 (High-speed CAN)
CAN bit rates	20 kbit/s – 1 Mbit/s
CAN FD bit rates	20 kbit/s – 12 Mbit/s
Controller	FPGA implementation
Transceiver	MCP2558FD
Galvanic isolation	up to 300 V (separate for each CAN connector)
Daisy Chain	D-Sub pin 1 and 8 via solder bridges, not activated at delivery
Internal termination	via solder bridges, not activated at delivery

Power supply		
Supply voltage	3.3 V	
Current consumption	**Product version**	**at 3.3 V pin**
	Single Channel	max. 450 mA
	Dual Channel	max. 550 mA
	Four Channel	max. 750 mA

Measures	
Size	Single and Dual Channel: 22 x 80(60) x 4.6 mm (W x L x H) Component height of the top is 2.4 mm above the form factor specification of 1.5 mm. Four Channel: 22 x 80(60) x 10.2 mm (W x L x H) Component height of the top is 8 mm above the form factor specification of 1.5 mm. See also dimension drawing in Appendix B on page 38.
Weight	Single and Dual Channel: 6 g Four Channel: 10 g Cable for D-Sub connection: Single channel cable 7 g Dual channel cable 7 g
Length connection cable (card - D-Sub)	20 cm, other cable lengths on request

Environment	
Operating temperature	-40 - 85 °C (-40 - 185 °F)
Temperature for storage and transport	-40 - 100 °C (-40 - 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-M.2

Item number(s): IPEH-004083/84/85

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

Uwe Wilhelm, Managing Director

Appendix B Dimension Drawing

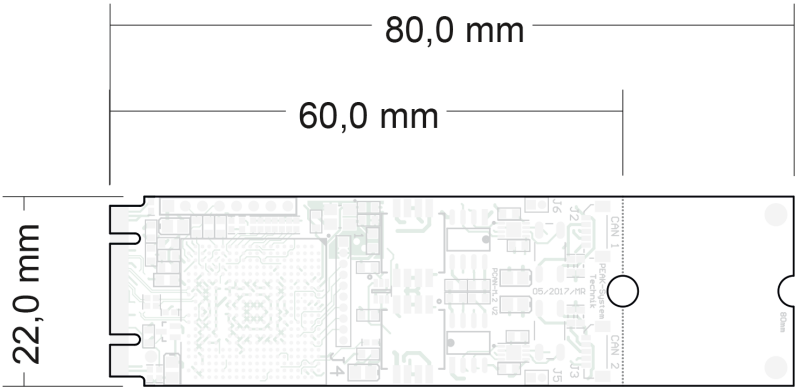


Figure 22: View onto the PCAN-M.2 Single and Dual Channel **(IPEH-004083/84)**.
The height is approx 4.6 mm. The form factor specification of a maximum height of 1.5 mm is not fulfilled by the component height of 2.4 mm on the top side.

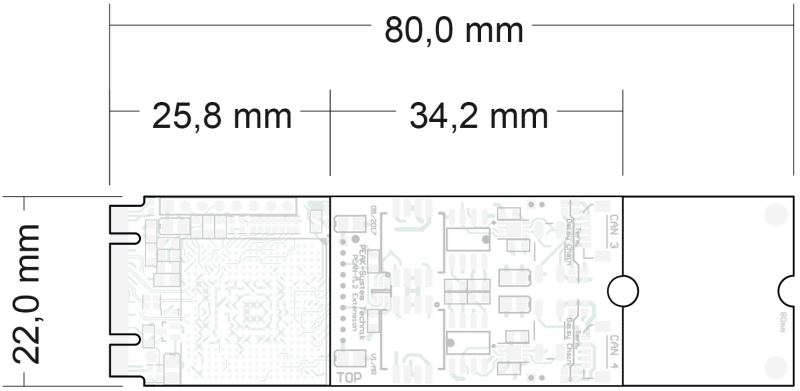


Figure 23: View onto the PCAN-M.2 Four Channel **(IPEH-004085)**.
The height is approx 10.2 mm. The form factor specification of a maximum height of 1.5 mm is not fulfilled by the component height of 8 mm on the top side.

The figures do not show the actual size of the products.

Appendix C Quick Reference

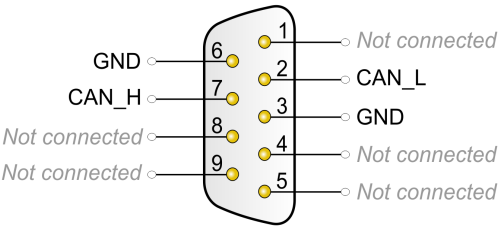
Software/Hardware Installation under Windows

Install the driver from the supplied DVD, before you insert the plug-in card. Turn off the computer and insert the PCAN-M.2 into an available M.2 slot.

If you do not have an M.2-**2280** slot, you can shorten the card to **2260** format. To do this, carefully break the back of the card along the predetermined breaking point.

The new hardware is detected at the next Windows start and the driver is initialized. Check the operational readiness. Open the Windows Start menu. Type `peakcpl` and press Enter.
An information window for PEAK Hardware opens. The plug-in card must be displayed in the table on the **CAN Hardware** tab.

Getting Started under Windows

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

High-speed CAN connector (D-Sub, 9 pins)