# Peak USB to CAN Interfaces

**COMSOL** distributes the Peak System range of CAN and CAN FD Interfaces, Adapters, I/O Modules, Data Acquisition Systems and Supporting Software.

This leaflet describes the Peak range of low cost interfaces between the PC's USB port and CAN.

The original 2.0 A/B PCAN-USB interface provides bit rates of up to 1 Mbit/sec and can support 11 or 29 bit ID's.

The PCAN-USB FD and PCAN-USB Pro FD interfaces provide support for the FD standard with up to 64 data bytes per frame transmitted at up to 12 Mbits/sec. They are downward compatible and will work with earlier 2.0 A/B standard units.

A full range of free drivers and supporting DLL as well as a simple CAN viewing and logging package are included.

Or follow these links for more information on:

**Other CAN PC Interfaces**

**Explorer -** our PC based CAN data logging, control and display software

**CAN Data Acquisition Systems**

**CAN I/O Modules**

**Software Support for FMS**

**Cables and Adapters**

**Our CAN and CAN FD tutorial -** provides information on both standards.

Most of these items are available from our **Web Shop** for next day delivery.

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# PCAN-USB

## USB to CAN Interface

The PCAN-USB adapter enables simple connection to CAN networks. Its compact plastic casing makes it suitable for mobile applications.

The opto-decoupled version guarantees galvanic isolation of up to 500 Volts between the PC and the CAN sides.

The package is also supplied with the CAN monitor PCAN-View for Windows and the programming interface PCAN-Basic.

| D-Sub | Pin | Pin assignment |
|-------|-----|----------------|
| | 1 | Not connected / optional +5V |
| | 2 | CAN-L |
| | 3 | GND |
| | 4 | Not connected |
| | 5 | Not connected |
| | 6 | GND |
| | 7 | CAN-H |
| | 8 | Not connected |
| | 9 | Not connected / optional +5V |

## Specifications

- Adapter for USB connection (USB 1.1, compatible with USB 2.0)
- USB voltage supply
- Bit rates up to 1 Mbit/s
- Time stamp resolution approx. 42 µs
- Compliant with CAN specifications 2.0A (11-bit ID) and 2.0B (29-bit ID)
- CAN bus connection via D-Sub, 9-pin (in accordance with CiA® 102)
- NXP SJA1000 CAN controller, 16 MHz clock frequency
- NXP PCA82C251 CAN transceiver
- 5-Volts supply to the CAN connection can be connected through a solder jumper, e.g. for external bus converter
- Extended operating temperature range from -40 to 85 °C (-40 to 185 °F)

Optionally available:
- Galvanic isolation on the CAN connection up to 500 V

## Ordering information

| Designation | Art. No. |
|-------------|----------|
| PCAN-USB | IPEH-002021 |
| PCAN-USB opto-decoupled | IPEH-002022 |

### Scope of supply

- PCAN-USB in plastic casing
- Device drivers for Windows 7/Vista/XP/Linux (32/64-bit)
- Device driver for Windows CE 6.x (x86 and ARMv4 processor support)
- PCAN-View CAN monitor for Windows
- PCAN-Basic programming interface consisting of an interface DLL, examples, and header files for all common programming languages
- Manual in PDF format

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# PCAN-USB FD

## CAN FD Interface for High-Speed USB 2.0

The CAN FD adapter PCAN-USB FD allows the connection of CAN FD and CAN networks to a computer via USB. A galvanic isolation of up to 500 Volts decouples the PC from the CAN bus. The simple handling and its compact plastic casing make the adapter suitable for mobile applications.

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 supplied Windows software PCAN-View is a simple CAN monitor for transmitting, receiving, and recording CAN messages. The current version of the program supports the new CAN FD standard.

## Specifications

- Adapter for High-speed USB 2.0 (compatible to USB 1.1 and USB 3.0)
- Complies with CAN specifications 2.0 A/B and FD
- CAN FD support for ISO and Non-ISO standard switchable
- CAN FD bit rates for the data field (64 bytes max.) from 40 kbit/s up to 12 Mbit/s
- CAN bit rates from 40 kbit/s up to 1 Mbit/s
- Time stamp resolution 1 µs
- CAN bus connection via D-Sub, 9-pin (in accordance with CiA® 102)
- FPGA implementation of the CAN FD controller
- NXP TJA1044GT CAN transceiver
- Galvanic isolation up to 500 V
- CAN termination can be activated through a solder jumper
- Measurement of bus load including error frames and overload frames on the physical bus
- Induced error generation for incoming and outgoing CAN messages
- 5-Volt supply to the CAN connection can be connected through a solder jumper, e.g. for external bus converter
- Voltage supply via USB
- Extended operating temperature range from -40 to 85 °C (-40 to 185 °F)

| D-Sub | Pin | Pin assignment |
|---|---|---|
| | 1 | Not connected / optional +5V |
| | 2 | CAN-L |
| | 3 | GND |
| | 4 | Not connected |
| | 5 | Not connected |
| | 6 | GND |
| | 7 | CAN-H |
| | 8 | Not connected |
| | 9 | Not connected |

## Ordering information

| Designation | Part No. |
|---|---|
| PCAN-USB FD | IPEH-004022 |

### Scope of supply

- PCAN-USB FD in plastic casing
- Device drivers for Windows 8.1, 7, Vista and Linux (32/64-bit)
- PCAN-View CAN monitor for Windows (details on page 85)
- PCAN-Basic programming interface consisting of an interface DLL, examples, and header files for all common programming languages (details on page 76)
- Manual in PDF format

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# PCAN-USB Pro FD

## CAN FD and LIN Interface for High-Speed USB 2.0

The PCAN-USB Pro FD adapter enables the connection of CAN FD and LIN networks to a computer via USB. Two field busses can be connected at the same time, up to four with appropriate adapter cables (2 x CAN FD, 2 x LIN). Each CAN FD channel is separately isolated against USB and LIN with a maximum of 500 Volts. Its robust aluminum casing makes the PCAN-USB Pro FD adapter suitable for mobile applications.

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 supplied Windows software PCAN-View is a simple CAN monitor for transmitting, receiving, and recording CAN messages. The current version of the program supports the new CAN FD standard.
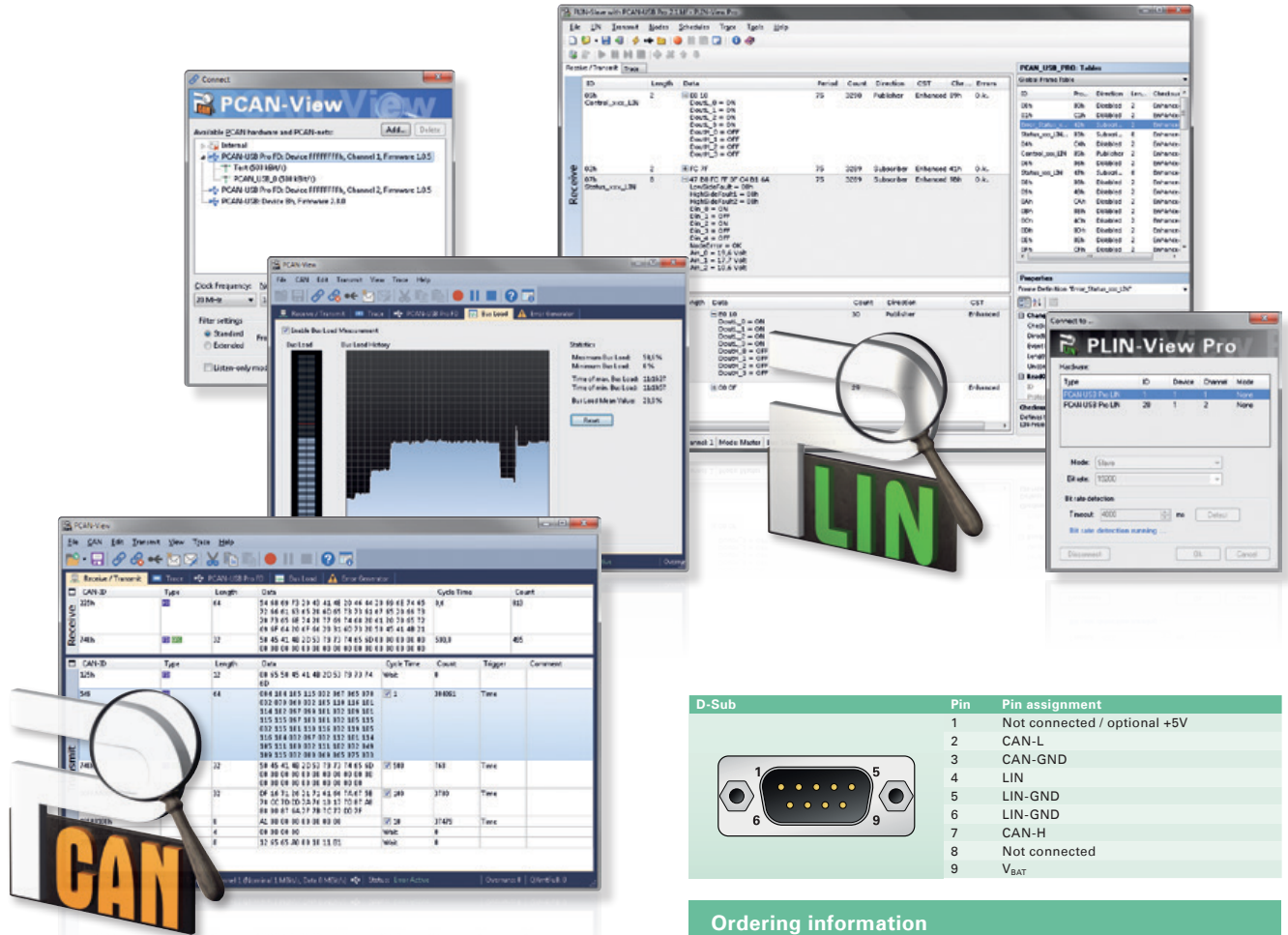
The monitor application PLIN-View Pro as well as the PLIN programming interface are also included in the scope of supply.

**Specifications**

- Adapter for High-speed USB 2.0 (compatible to USB 1.1 and USB 3.0)
- Transmitting and receiving of CAN FD and LIN messages using 2 D-Sub connections (both with pin assignment for the CAN FD and LIN bus)
- Time stamp resolution 1 µs
- 5-Volt supply at the D-Sub connector can be activated through a solder jumper, e.g. for external bus converter
- Voltage supply via USB
- Extended operating temperature range from -40 to 85 °C (-40 to 185 °F)

CAN operation properties:
- Complies with CAN specifications 2.0 A/B and FD
- CAN FD support for ISO and Non-ISO standard switchable
- CAN FD bit rates for the data field (64 bytes max.) from 40 kbit/s up to 12 Mbit/s
- CAN bit rates from 40 kbit/s up to 1 Mbit/s

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- FPGA implementation of the CAN FD controller
- NXP TJA1044GT CAN transceiver
- Each CAN FD channel is separately opto-decoupled against USB and LIN up to 500 V
- CAN termination can be activated through a solder jumper
- Measurement of bus load including error frames and overload frames on the physical bus
- Induced error generation for incoming and outgoing CAN messages

LIN operation properties:
- Bit rates from 1 kbit/s up to 20 kbit/s
- TJA1021/20 LIN transceiver
- Both LIN channels (common ground) are opto-decoupled against USB and CAN FD
- Can be used as a LIN master or slave (1 ms master task resolution)
- Automatic bit rate, frame length, and checksum type recognition
- Autonomous scheduler with support for unconditional, event, and sporadic frames
- Hardware can work through a schedule table (up to 8 schedule tables can be configured with a total of 256 slots)

| D-Sub | Pin | Pin assignment |
|---|---|---|
| | 1 | Not connected / optional +5V |
| | 2 | CAN-L |
| | 3 | CAN-GND |
| | 4 | LIN |
| | 5 | LIN-GND |
| | 6 | LIN-GND |
| | 7 | CAN-H |
| | 8 | Not connected |
| | 9 | $V_{BAT}$ |

### Ordering information

| Designation | Part No. |
|---|---|
| PCAN-USB Pro FD | IPEH-004061 |

**Scope of supply**

- PCAN-USB Pro FD in aluminum casing
- CAN FD interface drivers for Windows 8.1, 7, Vista and Linux (32/64 bit)
- LIN interface drivers for Windows 8.1, 7, Vista (32/64 bit)
- PCAN-View CAN monitor for Windows (details on page 85)
- PLIN-View Pro LIN monitor for Windows (details on page 86)
- PCAN-Basic programming interface consisting of an interface DLL, examples, and header files for all common programming languages (details on page 76)
- PLIN-API programming interface consisting of an interface DLL, an example, and header files for all common programming languages
- Manual in PDF format

**Please note:** The PCAN-USB Pro FD can be used alternatively for the PCAN-USB Pro, because this CAN interface is no longer manufactured!
The PCAN-USB Pro FD behaves identically concerning the CAN and LIN functionality.

# Using CAN

## PEAK CAN Controllers
**The Peak range of CAN interfaces provides simple and cost effective connections between PCs and CAN-networks and includes routers, extenders and adapters to the many CAN variants.**

**USB**

**PCMCIA**

**PARALLEL PORT**

**ISA**

**PCI**

**PC/104**

**PCAN interfaces support both 11 bit ID and 29 bit ID CAN specifications with a maximum speed of 1Mbaud.** They use the SJA1000 CAN-controller and the 82C251 driver. The CAN-bus connection is via a 9-pin SUB-D plug, whose pin assignments conform to the CiA recommendation. No termination is included in the interfaces. Optoisolated versions are available if required and most interfaces can be supplied with one or two ports.
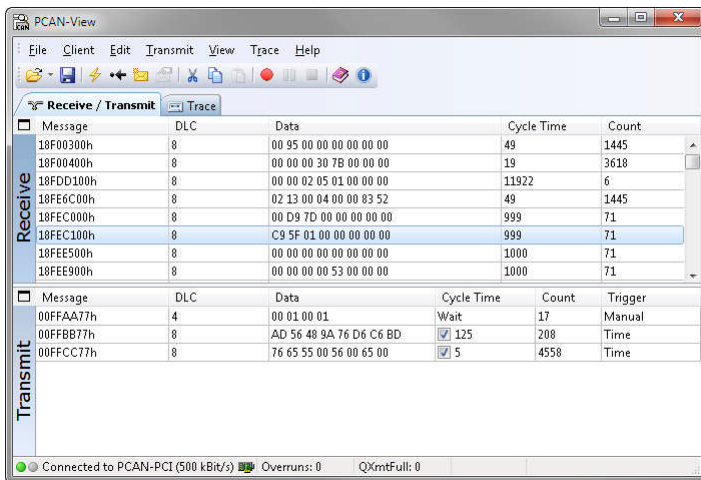
Drivers and supporting DLL's are included to allow operation under XP, Vista, Windows 7 and Linux in 32 and 64* bit modes. CE6.x support* for ARM and x86 is also available. (* most interfaces). Language support is provided for C++, C#, C++/CLR, Delphi, VB.NET, Java and Python 2.6.

A Windows package PCAN-View is included with all interfaces to allow the user to view messages on the CAN bus. All data is displayed in Hex and messages are timed and counted. A trace buffer allows messages to be recorded and saved to disk. Errors such as over-run and baud rate problems are reported. Messages can be user created and then sent as one-shot, repeating periodically or in response to a remote request (RTR).

## Industrial I/O Modules
These Industrial I/O modules are available in a number of useful configurations including signal conditioning and termination in an industrial case. Up to 8 10 bit analogue inputs, 4 PWM/frequency outputs (to 20KHz) and 8 digital ins and outs are available. At 51 x 60 x 20mm, they are suitable for a wide variety of applications. The electrical connections provide snap-in termination; with a screw connection as an option. A windows package is provided so that the user can set message ID and data layouts and conversion constants as well as setting report rates or reporting on change.

CAN Open firmware is also available if required.

# PCAN-Explorer

This tool can be used as an advanced CAN bus traffic monitor. It provides the following features: Message identifiers can be given names avoiding having to remember each messages HEX value. Message data can be displayed in a wide range of formats including text, hex, signed, unsigned and floating point.

An extensive conditional macro language allows complex tests and simulations to be performed. Optional packages provide sophisticated graphing, CANdb data exchange, a visual GUI to control and display CAN data collection and a full J1939 symbol database simplifying control of ECU's.
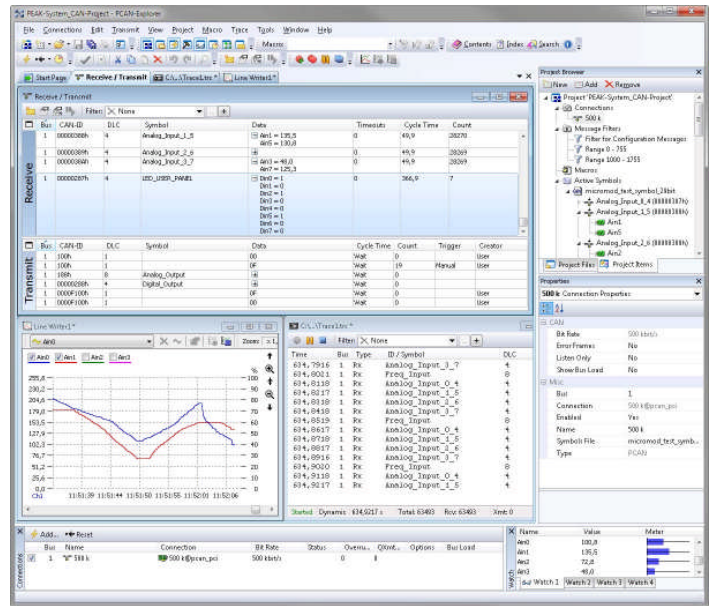
# PCAN-FMS Toolkit

A special software package is available to support FMS and Bus-FMS standards. It logs and translates the CAN messages in real time providing the user with a "Dashboard display". The log can be replayed to a CAN bus or values can be set manually from a convenient Windows display for system simulation.

# Data Acquisition Systems

Peak have a growing range of units designed to suite a variety of data acquisition requirements such as multi Thermocouple, A/D and D/A conversions and digital I/O. As well as data logging and mobile GPRS links there are also CAN Routers and filters. Some have full C programmability others only need simple windows configuration.

# CAN MicroMod Boards

A flexible, small format, Analogue and Digital I/O board with a CAN-Bus interface.

The PCAN-MicroMod board can be plugged into an application to provide control and monitoring services via the CAN-Bus. It provides the following

- 8 analogue inputs, 10-bits resolution, Vref 5 V
- 8 digital inputs & 8 digital outputs
- 4 PWM / frequency outputs, with a range 1 Hz-20 kHz

The integrated firmware provides simple configuration of the target system via a Windows utility program, the configuration data being sent to the board via CAN. No embedded programming skills are required to set up a system. Up to 32 PCAN-MicroMod boards can be put onto a single CAN network.
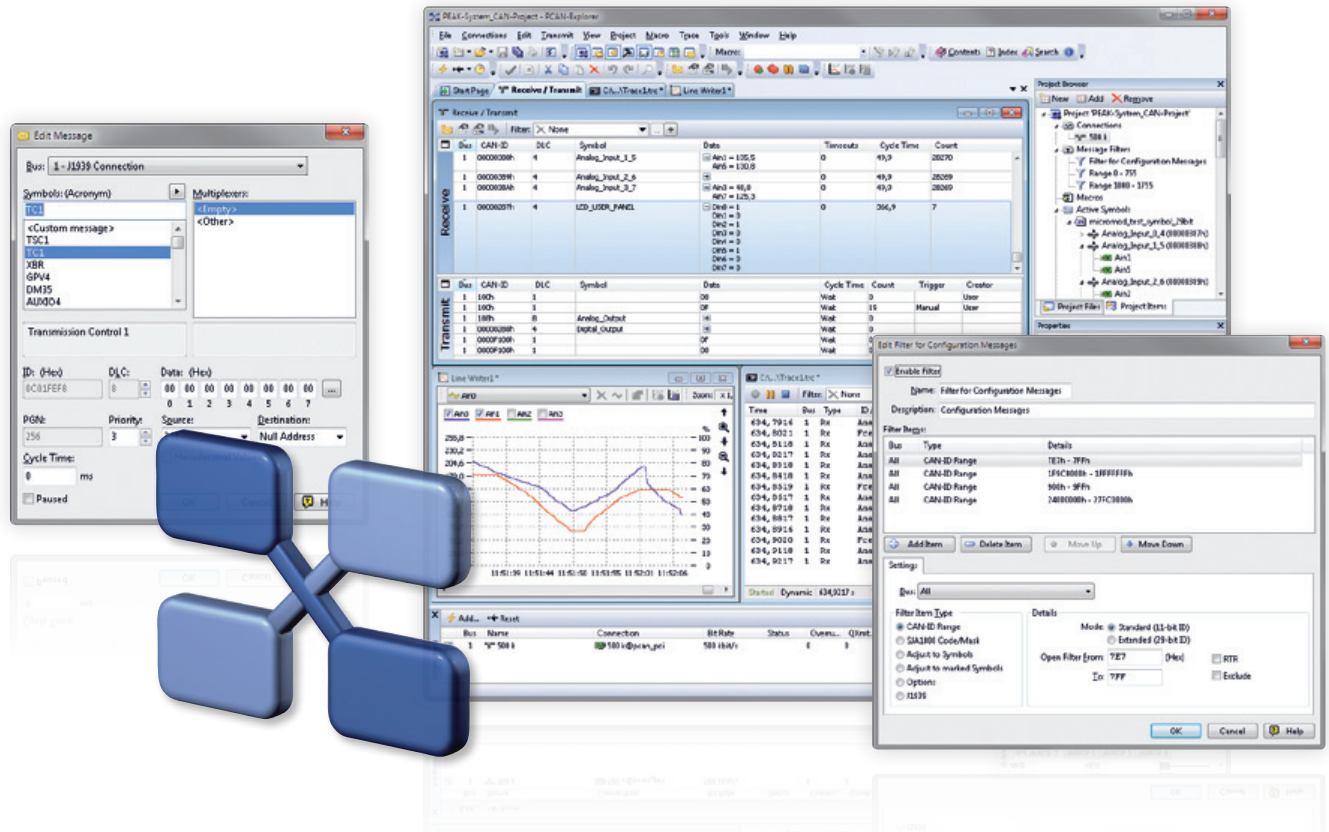
An optional evaluation board simplifies development of user designed carrier boards and also makes the MicroMod an ideal CAN evaluation tool.

Call or email us with your requirements.
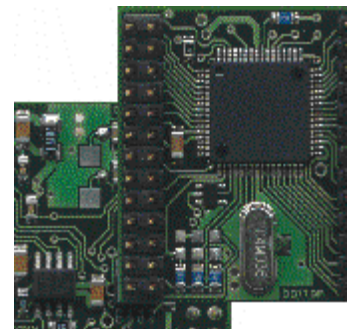
# PCAN-Explorer 5

## Comprehensive CAN Monitor for Windows



PCAN-Explorer is a universal tool for monitoring data traffic on a CAN network. For easy and clear allocation of the individual messages, these can be identified as so-called symbols. The integrated VBScript support allows the creation of macros to automate complex tasks. The integrated data logger means that the data traffic of a bus can be recorded, analyzed, and stored. PCAN-Explorer is designed as automation server and can therefore be remote controlled through scripts.

### Features

└── All files and elements can be managed and saved in projects

└── Project components such as CAN connections, symbol files and macros are clearly displayed and laid out in the project browser

└── The new start page allows fast access to the most recently opened projects or files

└── Simultaneous connections with multiple networks/ CAN interfaces of the same hardware type

└── Connection window with an overview of all connections, complete with status, error counters, bus load, etc.

└── All parameters of all elements in the user interface can be examined using a property window and edited if necessary.

└── Multiple flexible filters can be configured and, for example, assigned to the transmit/receive window or the various different tracers

└── Tabs to switch between the different Windows

└── Flexible arrangement of the user interface using the dockable windows

└── User-defined column display and arrangement in transmit/receive window

└── J1939 support with the relevant add-in

└── Display of received messages showing the ID, length, data bytes, number of messages received and receiving interval

└── Simultaneous hexadecimal and symbolic representation of the details

└── Display of remote frames, status reports of the CAN controller and, as option, CAN-bus error frames also

└── Logging of time-outs

└── Sending of messages at fixed intervals of time, manually or as reply to remote frames
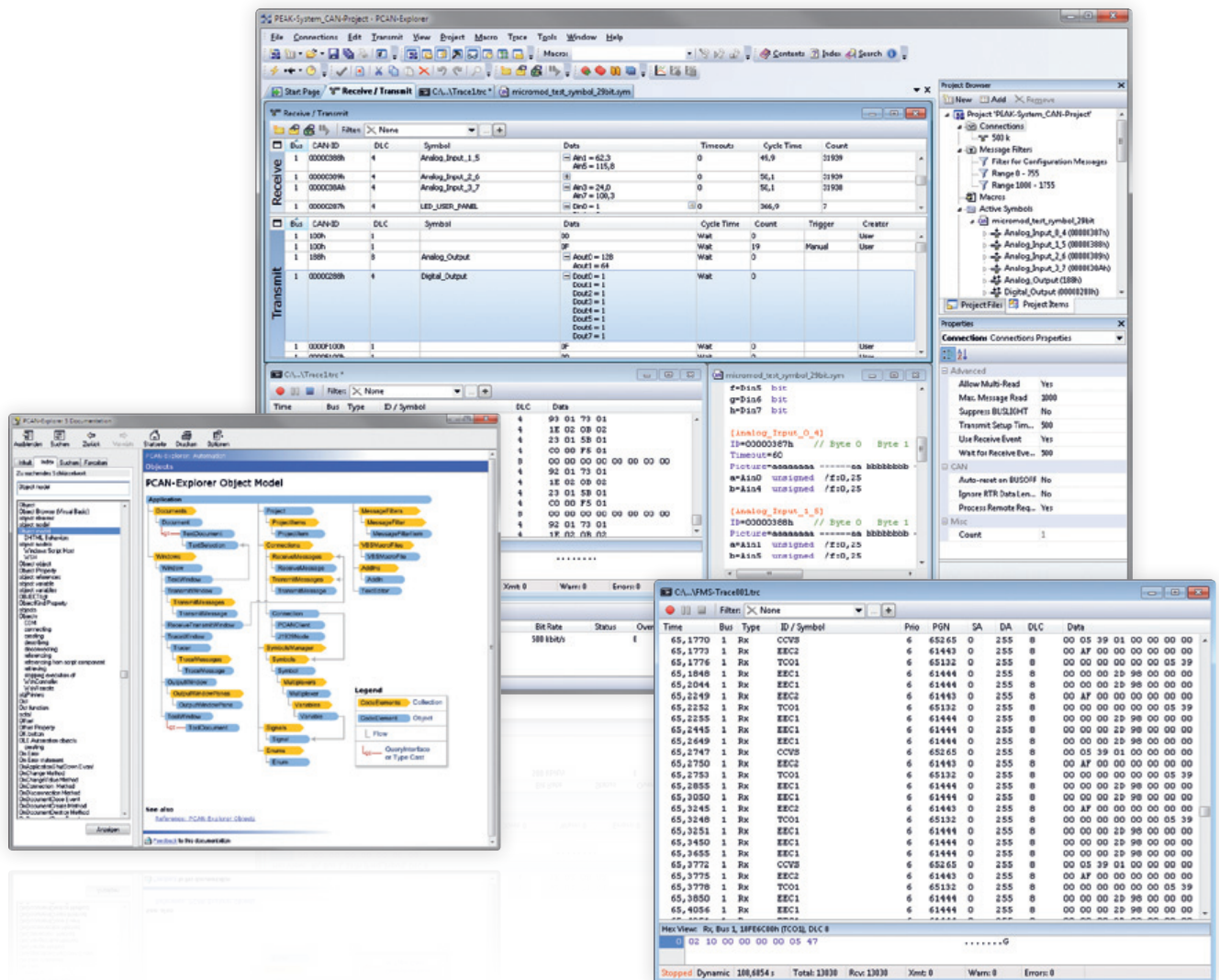
Messages can be created as send lists, stored and loaded as desired, in order to e. g. emulate CAN nodes

Periodical sending with up to 1 ms precision

Easy creation of symbol files and macros using the integrated text editor with syntax highlighting

User-friendly real-time monitoring of several signals via the watch window

Extensive improvements to user guidance and interface compared to PCAN-Explorer version 4

User interface language can be switched (German/English)

Simple integration of external tools

Integration of Add-Ins to upgrade functionality

Properties of the integrated, configurable PCAN-Explorer data logger:

Operation of multiple tracers at the same time

Variable buffer size

Optional linear buffer or circular buffer

Representation of the logged messages with time stamp, type, ID, length and data bytes

Logging of errors that have occurred is possible

Flexible storage possibility for the logged data in text form for importing into Excel or similar

Filtering of the messages for logging through symbol definitions

Subsequent examination of the logged data in the buffer via different symbol files

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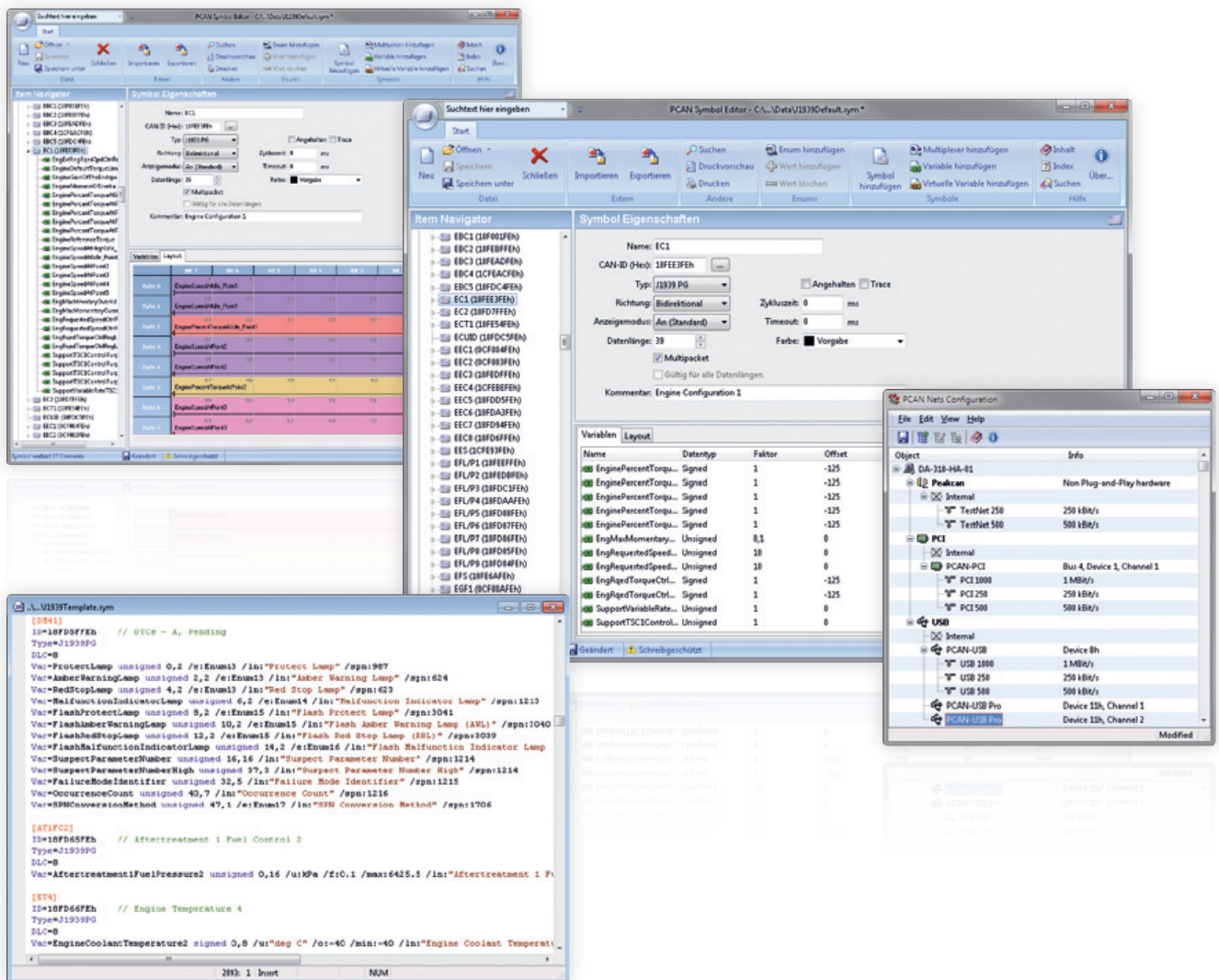
Function upgrade of the PCAN-Explorer with the integrated VBScript language:

- Creation of macros in VBScript with the integrated text editor
- Access with macros and scripts to almost all program elements via the PCAN-Explorer object model
- Ideal for creating test tools to implement or develop CAN systems
- Examples: sending of e-mails when a temperature is exceeded, starting of a test tool when a particular message is received, opening of an Excel sheet when an event occurs and saving of data in the individual cells
- Assignment of function keys with individual send messages or macros
- VBS scripts run in the background even without the PCAN-Explorer interface

### Ordering information

| Designation | Art. No. |
|---|---|
| PCAN-Explorer 5 | IPES-005028 |

**Scope of supply**
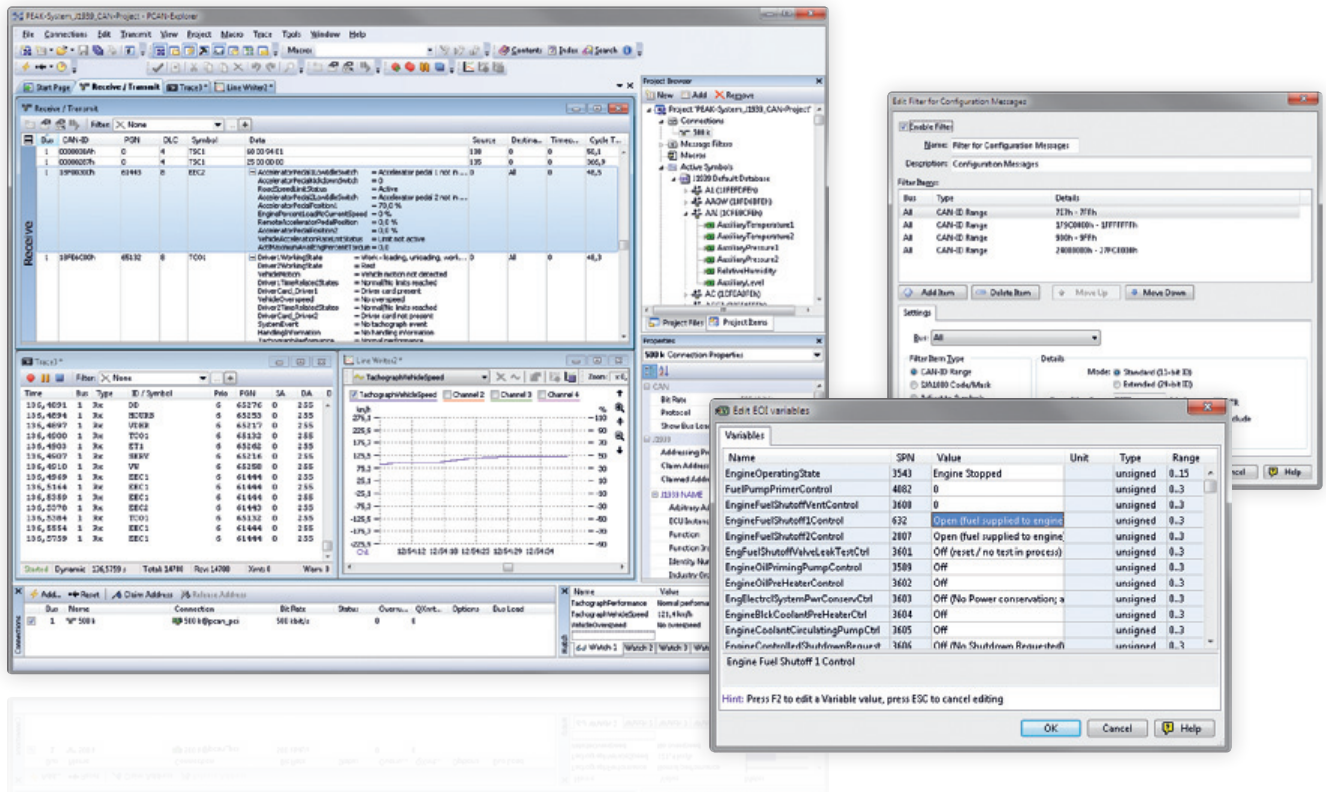
- PCAN-Explorer installation CD including PCAN-Explorer Line Writer Add-in
- PCAN Symbol Editor for Windows (details on page 62)
- Documentation in HTML help format

**System requirements**

- Windows 7/Vista/XP (32/64-bit)
- At least 512 MB RAM and 1 GHz CPU

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# PCAN-Explorer Add-ins

Optional Function Upgrades for PCAN-Explorer



### J1939 Add-in

The SAE J1939 network protocol describes communication on a CAN bus in utility vehicles for the transmission of diagnostics data and control information. It contains a complete network definition using 29-bit CAN-IDs (CAN 2.0B Extended Frame).

The J1939 add-in for PCAN-Explorer 5 supports all definitions established by the standard's parameter groups and provides a simple means of accessing the parameters. A complete database of all the definitions and the parameters contained is also supplied.

### Features

└── Support for all functions of the SAE J1939 network protocol
└── CAN messages can be sent in broadcast form or targeted to individual control units (ECUs)
└── Addressing of up to 254 ECUs
└── Supports multi-packet messages

## Ordering information

| Designation | Art. No. |
|---|---|
| J1939 Add-in | IPES-005089 |

**Scope of supply**

└── J1939 Add-in software
└── Documentation in HTML help format

**System requirements**

└── PCAN-Explorer 5
└── Windows 7/Vista/XP (32/64-bit)
└── At least 512 MB RAM and 1 GHz CPU

# PCAN-Explorer Add-ins

Optional Function Upgrades for PCAN-Explorer
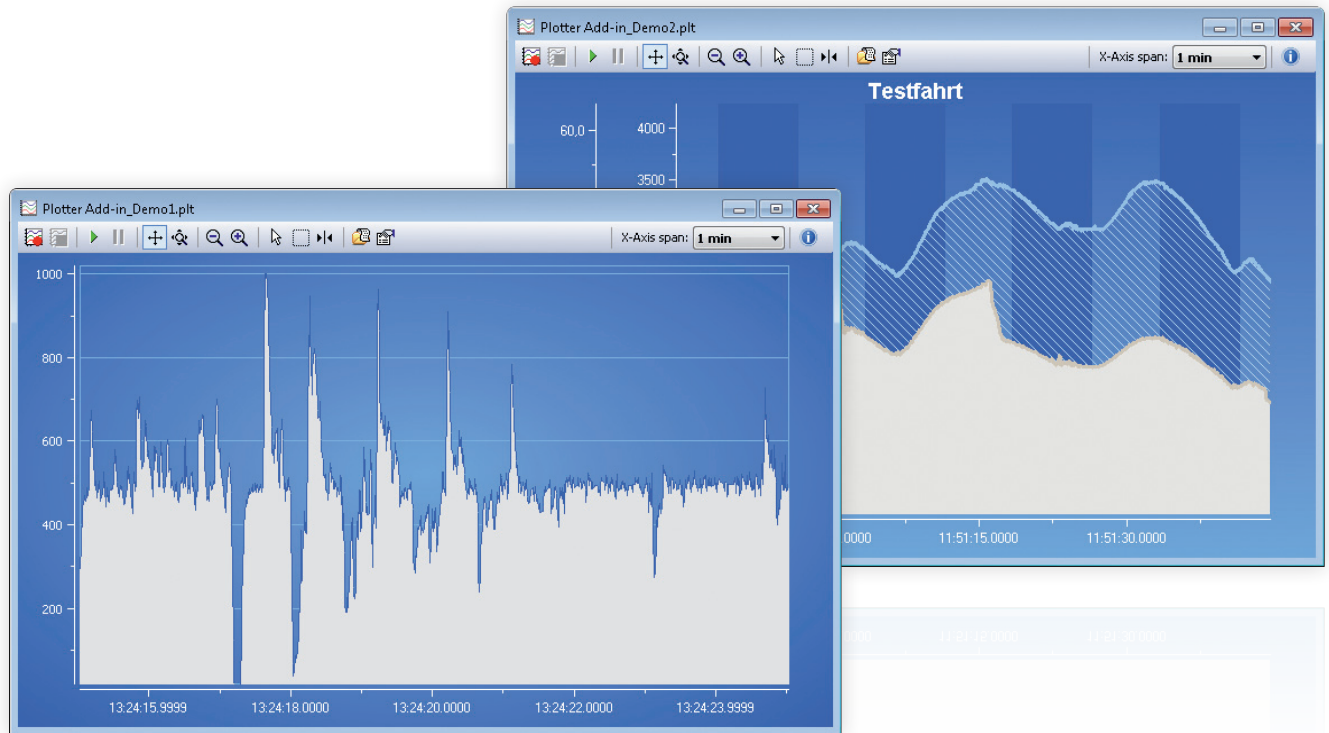
## Plotter Add-in 2

The plotter allows the graphical representation of CAN data using any number of channels.

### Features

- Real-time display
- Unlimited number of channels
- Unlimited number of Y-axes
- X-axis and Y-axes can be zoomed and scrolled quite freely, even during recording
- Labelling of time axis with absolute or relative time stamps
- Facility for automatic adaptation of axes to plots
- Reversible Y-axes
- Logarithmic scales
- Cursor display for plot measurement
- Export to EMF-, PNG-, BMP-, JPEG graphical formats
- Data import from the PCAN-Explorer Tracer

- Representation of limiting values and value ranges
- Comprehensive formatting options for representing the curves, axes and the plotter layout

### Ordering information

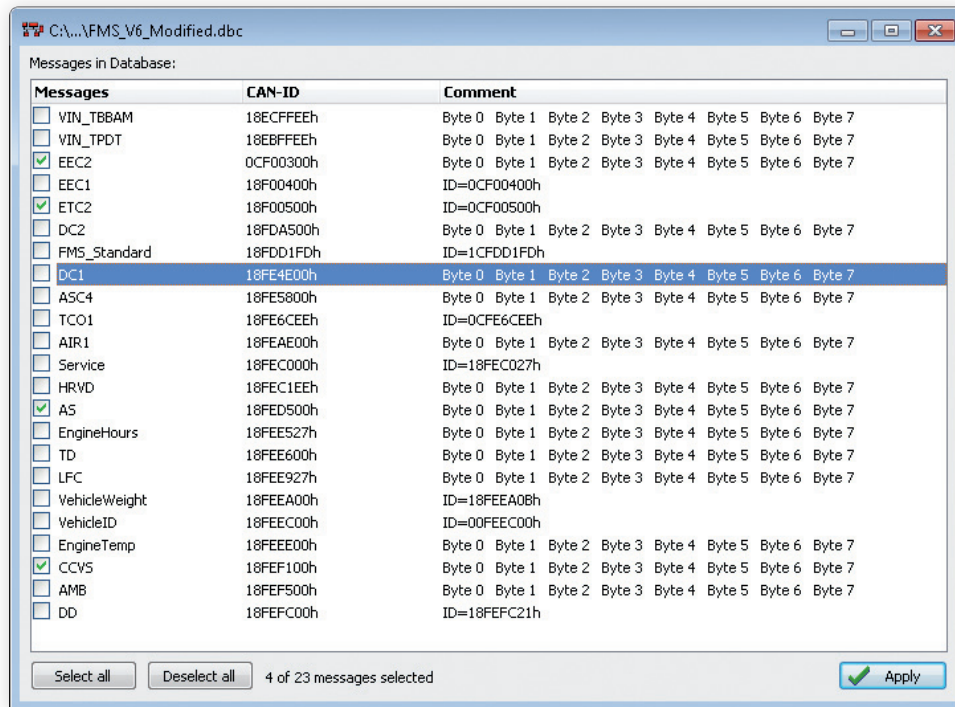| Designation | Art. No. |
| --- | --- |
| Plotter Add-in 2 | IPES-005087 |

**Scope of supply**

- PCAN-Plotter Add-in software

**System requirements**

- PCAN-Explorer 5
- Windows 7/Vista/XP (32/64-bit)
- At least 512 MB RAM and 1 GHz CPU

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# PCAN-Explorer Add-ins

Optional Function Upgrades for PCAN-Explorer



## CANdb Import Add-in 3

The CANdb format is a common data description format for CAN bus information in the car industry.

CANdb Import allows the import of CANdb files. This is a useful function for all those who do not want to manually transcribe their database into the PCAN-Explorer symbol file format.

### Features

- Opening of CANdb files (.dbc)
- Selecting of the messages for importing in a CANdb file
- Saves data using the project administration function in PCAN-Explorer
- Storing in the PCAN-Explorer symbol file format

### Ordering information

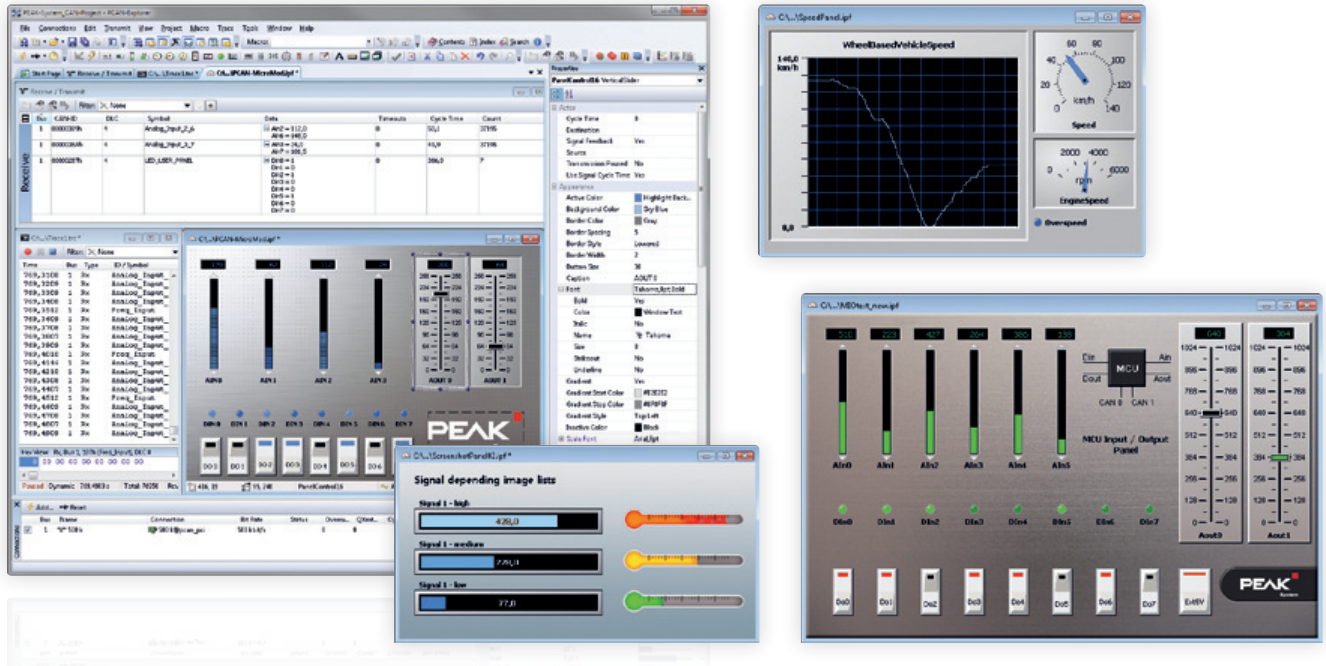| Designation | Art. No. |
|---|---|
| CANdb Import Add-in 3 | IPES-005086 |

**Scope of supply**

- CANdb Import Add-in software
- Documentation in HTML help format

**System requirements**

- PCAN-Explorer 5
- Windows 7/Vista/XP (32/64-bit)
- At least 512 MB RAM and 1 GHz CPU

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System

# PCAN-Explorer Add-ins

### Optional Function Upgrades for PCAN-Explorer

## Instruments Panel Add-in 3

The Instruments Panel Add-in allows the graphical representation of digital and analog signals using different display instruments. The integrated input options and controllers mean that signals can also be produced on the CAN bus, allowing easy simulation of complex CAN applications.

- Free positioning of the instruments using drag & drop, or numerical inputs for spot-on positioning
- Loading and storing of complete panel configurations

## Features

- Representation of analog and digital signals from received CAN messages using different display instruments
- In addition to potentiometers, switches, and sliding controllers input fields can be used to generate CAN messages
- Selection and configuration of multiple elements at the same time
- Extensive configuration of the properties of one or more elements using the new property window
- The new Instruments Panel object model enables complete automation using COM and scripts
- Representation of different scenes on the same panel during running time
- Signal-dependent display of image lists and scenes

## Ordering information

| Designation | Art. No. |
|---|---|
| Instruments Panel Add-in 3 | IPES-005088 |

### Scope of supply

- Instruments Panel Add-in software
- Documentation in HTML help format

### System requirements

- PCAN-Explorer 5
- Windows 7/Vista/XP (32/64-bit)
- At least 512 MB RAM and 1 GHz CPU

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# PCAN-Trace

## Comprehensive Data Logger for CAN Messages

The PCAN-Trace program is a data logger for up to 9,999,000 CAN messages. It enables CAN messages to be quickly recorded, saved, and even played back on the CAN bus. The program displays the number of received messages, and identifies the types of the messages (data frame, error frame, RTR frame).

CAN messages can be recorded or replayed in linear or ring buffer mode. PCAN-Trace also provides an option to play back CAN messages in single step mode. You can also simplify analysis and tracing by setting playback mode breakpoints.
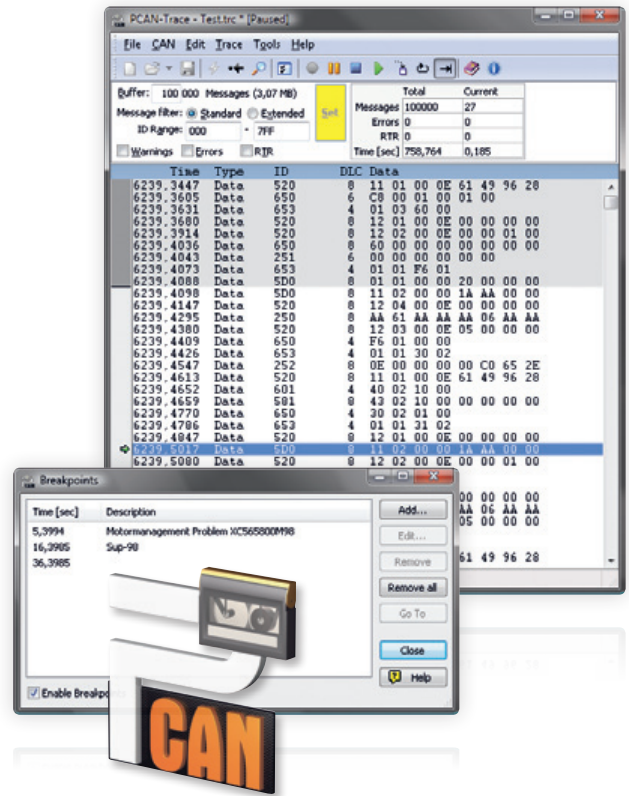
### Features

└── Log facility for up to 9,999,000 CAN messages
└── Choice of linear buffer or ring buffer (in receive and playback mode)
└── Displays number and type of received CAN messages
└── Adjustable message filter
└── Support for 11-bit and 29-bit IDs
└── Facility to play back CAN messages that have been recorded using PCAN-Explorer, even in single-step mode
└── Breakpoints can be used in playback mode
└── Integrated online help
└── Received data can also be viewed in a text editor

### Ordering information

| Designation | Art. No. |
|---|---|
| PCAN-Trace | IPES-002027 |

**Scope of supply**

└── PCAN-Trace installation CD (in English)
└── Documentation in HTML help format

**System requirements**

└── Windows 7/Vista/XP (32-bit)
└── At least 512 MB RAM and 1 GHz CPU