PCAN-Router

Universal CAN Converter

User Manual

PEAK System

Products taken into account

Product Name	Model	Item Number	Ser. no.
PCAN-Router	2 D-Sub connectors, additional digital input, LPC2129, 2 kBit EEPROM	IPEH-002210	up to 00299
PCAN-Router	Screw terminal block, additional serial interface, LPC2129, 2 kBit EEPROM	IPEH-002210-P	up to 00299
PCAN-Router	2 D-Sub connectors, additional digital input, LPC2194/01, 256 kBit EEPROM	IPEH-002210	starting at 00300
PCAN-Router	Screw terminal block, additional serial interface, LPC2194/01, 256 kBit EEPROM	IPEH-002210-P	starting at 00300

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Contents

1 Introduction

The PCAN-Router is a module with two CAN channels, the data traffic of which is processed by a freely programmable microcontroller. This means that incoming CAN messages can be individually evaluated, converted, and filtered in order to then send the adjusted CAN messages to the respective other network.

You can copy any firmware you have developed yourself to the PCAN-Router via the boot loader, which has already been implemented, by using CAN. The PCAN-Router is supplied with a demo firmware which forwards CAN messages 1:1 between the two channels at 500 kBit/s. The respective source code is included on the supplied CD.

1.1 Properties at a Glance

- Microcontroller with 16/32-Bit ARM CPU:
  - NXP (Philips) LPC2129 (up to ser. no. 00299)
  - NXP (Philips) LPC2194/01 (starting at ser. no. 00300)
- EEPROM add-on memory:
  - 2 kBit (up to ser. no. 00299)
  - 256 kBit (starting at ser. no. 00300)
- Import of a new firmware via CAN
- Two High-speed CAN channels (ISO 11898-2), up to 1 MBit/s
- One additional LIN channel on request
- Status indication with two duo LEDs

- Connections via two 9-pin D-Sub connectors or a 10-pin screw terminal block (Phoenix)
- Additional digital input (applies for version with D-Sub connectors only)
- Additional serial RS-232 interface (only for version with screw terminal block)
- 4-bit coding of the hardware by solder bridges
- Aluminum profile housing with option of fitting on top hat rails

1.2 Scope of Supply

The scope of supply normally consists of the following parts:

- PCAN-Router in aluminum profile housing
- 10-pin screw terminal block bar (IPEH-002210-P only)
- CD with documentation, Windows software (C and C++ compiler GNU WinARM, flash program), and demo project

1.3 Prerequisites for the Operation

The following prerequisites must be given, so that you can use the PCAN-Router properly:

- Power supply in the range of 7.5 to 26 V DC
- To upload a new firmware via CAN you need:
  - CAN interface of the PCAN series for the computer (e.g. PCAN-USB)
  - Windows 2000 SP4 / XP SP2 / Vista (32 Bit)

2 Connectors and Coding Solder Bridges

The PCAN-Router is supplied in two versions which differ in the type of connections and the signals provided in addition to the CAN channels:

- with two 9-pin D-Sub connectors, additional digital input (IPEH-002210)
- with a 10-pin screw terminal block, additional serial interface (IPEH-002210-P)

For direct access to the serial and debugging ports of the microcontroller, additional – yet not equipped – connector panels are available on the PCAN-Router's board.

Furthermore the board has four coding solder bridges in order to assign a fixed status to the corresponding input bits of the microcontroller.

The following subsections describe each connector assignment.

2.1 D-Sub Connector

(IPEH-002210 only)

The D-Sub connectors are used for the CAN channels CAN1 and CAN2.

The power supply can be provided via both connectors. The supply connections $+U_{b1}$ and $+U_{b2}$ are connected internally in a reactionless configuration. This means that different power sources can be connected, if applicable.

The CAN1 connector also offers a pin to activate the bootloader (Boot CAN1, see section 6.1 *Uploading Firmware via CAN* on page 22) and the CAN2 connector a digital input (Din0) which can be interpreted by the microcontroller.

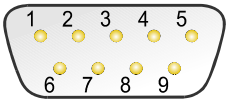


Figure 1: CAN1 and CAN2 D-Sub connector pins

Pin	Function connector CAN1	Function connector CAN2
1	Not used	Not used
2	CAN1_L	CAN2_L
3	GND	GND
4	Reserved (LIN)	Not used
5	SHIELD	SHIELD
6	Boot CAN1 (high-active)	Not used
7	CAN1_H	CAN2_H
8	Not used	Din0 (low-active)
9	Supply $+U_{b1}$ (7.5 - 26 V DC)	Supply $+U_{b2}$ (7.5 - 26 V DC)

See also chapter 3 *Port Assignment of the Microcontroller* on page 13.

2.2 Screw Terminal Block

(IPEH-002210-P only)

Apart from power supply and CAN channels, the screw terminal block includes connections for a serial interface with RS-232 levels.

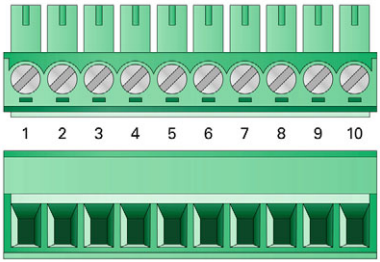


Figure 2: Screw terminal block connections

Terminal	Function
1	Supply $+U_b$ (7.5 - 26 V DC)
2	GND
3	CAN1_L
4	CAN1_H
5	CAN2_L
6	CAN2_H
7	Boot CAN1 (high-active)
8	Reserved (LIN)
9	RS-232 RxD
10	RS-232 TxD

See also chapter 3 *Port Assignment of the Microcontroller* on page 13.

2.3 J4 Connector Panel: Serial Ports

The non-equipped connector panel J4 on the PCAN-Router's board provides an additional access option to the serial ports of the LPC2129 or LPC2194/01 microcontroller (µC).

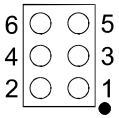


Figure 3: Distribution of pins in connection panel J4

Pin	Signal	Port µC
1	RxD0	P0.1
2	TxD0	P0.0
3	Not used	
4	/Boot_ser	P0.14
5	GND	
6	+5.0 V	

The RxD0 and TxD0 signals are forwarded to a level converter for the RS-232 standard. The PCAN-Router version with screw terminal block provides access to the adjusted signals at terminals 9 (RS-232 RxD) and 10 (RS-232 TxD).

Attention! The RxD0 (pin 1) and TxD0 (pin 2) signals in connector panel J4 are designed for TTL levels only. Using RS-232 levels at these connections can cause damage to the PCAN-Router's electronics.

2.4 J5 Connector Panel: JTAG Ports

The non-equipped connector panel J5 on the PCAN-Router's board provides an additional access option to the JTAG ports of the LPC2129 or LPC2194/01 microcontroller (µC) for hardware debugging.

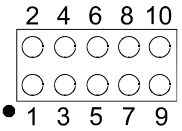


Figure 4: Distribution of pins in connection panel J5

Pin	Signal	Port µC	Internal wiring
1	GND		
2	GND		
3	/Reset	/Reset	Pull-up
4	3.3 V		
5	TCK	P1.29	Pull-down (R30)
6	TMS	P1.30	Pull-up
7	TDO	P1.27	Pull-up
8	TDI	P1.28	Pull-up
9	RTCK	P1.26	Pull-down (R31)
10	TRST	P1.31	Pull-up

If constant internal pull-down wiring of the TCK or RTCK signals is not suitable for your purposes, you can remove the respective pull-down resistor on the PCAN-Router's board by soldering it out. Both resistors (each 10 kΩ) are located next to the J5 connector panel J5 (see figure).

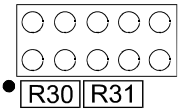


Figure 5: Position of pull-down resistors next to the J5 connector panel

2.5 Coding Solder Bridges

The four positions for coding solder bridges (ID 0 - 3) are each assigned to one port of the microcontroller LPC 2129 or LPC2194/01 (µC):

Position	0	1	2	3
Port µC	P0.4	P0.5	P0.6	P0.7

Position is ...	Status at the port
jumpered	Low
open	High

The status of the ports is relevant in the following cases:

- The loaded firmware is programmed so that it reads the status at the corresponding ports of the microcontroller. E.g. the activation of certain functions of the firmware or the coding of an ID is conceivable here.
- When uploading a firmware via CAN, the PCAN-Router is identified by a 4-bit ID which is determined by the solder bridges. A bit is set (1), if the corresponding solder bridge position is open (default setting: ID 15, all positions open).

Position	0	1	2	3
Binary digit	0001	0010	0100	1000
Decimal equivalent	1	2	4	8

See also section 6.1 *Uploading Firmware via CAN* on page 22.

3 Port Assignment of the Microcontroller

The following table lists the used inputs and outputs (ports) of the LPC2129 and LPC2194/01 microcontroller (µC) and their function in the PCAN-Router.

Port	I/O	µC function	Signal	Active (µC)	Function/connection[1]
P0.0	O	TxD UART0	TxD0		Serial communication, Transmit, J4:2 or STB:10 (RS-232 levels)
P0.1	I	RxD UART0	RxD0		Serial communication, Receive, J4:1 or STB:9 (RS-232 levels)
P0.2	I, O	SCL	SCL		I^2C bus to the EEPROM Microchip 24LC02B or Atmel AT24C256B[2]
P0.3	I, O	SDA	SDA		
P0.4	I	Port pin	ID0	High	Coding solder bridges on board (ID 0 - 3), jumpered = Low
P0.5	I	Port pin	ID1	High	
P0.6	I	Port pin	ID2	High	
P0.7	I	Port pin	ID3	High	
P0.8	O	TxD UART1	LIN_TxD		LIN Transmit[3]
P0.9	I	RxD UART1	LIN_RxD		LIN Receive[3]
P0.10	O	Port pin	LIN_en	High	Enable LIN transceiver[3]
P0.12	O	Port pin			Reserved

[1] CAN1/2:n Pin n of the respective D-Sub connector
STB:n Terminal n on the screw terminal block
J4/5:n Pin n of the respective connector panel on the board

[2] PCAN-Router serial numbers starting at 00300

[3] This function is available in the optional PCAN-Router version with LIN transceiver only.

Port	I/O	µC function	Signal	Active (µC)	Function/connection[1]
P0.13	I, O	Port pin			
P0.14	I	Port pin	/Boot_ser	Low	Activate flashing via serial interface, J4:4
P0.15	I	Port pin	/Boot_CAN	Low	Activate flashing via CAN 1 with 500 kBit/s, CAN1:9 and STB:7 (due to wiring high-active)
P0.17	O	Port pin	V24_en	High	Deactivate the RS-232 converter by Low level (activated by default); possibility for energy saving
P0.19	I	Port pin	Switch	High	Digital input Din0, CAN2:8 (due to wiring low-active)
P0.21	O	Port pin	CAN_en_2	Low	Activate the respective CAN transceiver[4]
P0.22	O	Port pin	CAN_en_1	Low	
P0.23	I	RD2	CAN2_RxD		CAN 2 Receive
P0.24	O	TD2	CAN2_TxD		CAN 2 Transmit
P0.25	I	RD1	CAN1_RxD		CAN 1 Receive
TD1	O	TD1	CAN1_TxD		CAN 1 Transmit
P0.27	I	Analog input	V-Power2		Measure voltage $+U_{b2}$, maximum value (0x03FF) corresponds to approx. 16.5 V
P0.28	I	Analog input	V-Power1		Measure voltage $+U_{b1}$ or $+U_b$, maximum value (0x03FF) corresponds to approx. 16.5 V
P0.29	I	Analog input			Is at GND
P0.30	I	Analog input			Is at 1.8 V (microcontroller supply)

[4] After resetting the microcontroller, the CAN transceivers are deactivated and must be reactivated to use them.

Port	I/O	µC function	Signal	Active (µC)	Function/connection[1]
P1.16	O[5]	Port pin		Low	LED CAN 1 red
P1.17	O[5]	Port pin		Low	LED CAN 1 green
P1.18	O[5]	Port pin		Low	LED CAN 2 red
P1.19	O[5]	Port pin		Low	LED CAN 2 green
P1.26		JTAG interface	RTCK		Debugging, J5:9
P1.27		JTAG interface	TDO		Debugging, J5:7
P1.28		JTAG interface	TDI		Debugging, J5:8
P1.29		JTAG interface	TCK		Debugging, J5:5
P1.30		JTAG interface	TMS		Debugging, J5:6
P1.31		JTAG interface	TRST		Debugging, J5:10

[5] It may occur that an LED glows slightly when the respective output is inactive. If you would like to prevent this, your firmware must change the port type to input (I). Before switching on the LED again, the respective port type must be set to output (O).

4 Operation

The PCAN-Router is activated by applying the voltage power to the respective input pins (see chapter 2 *Connectors and Coding Solder Bridges*). The firmware in the flash memory is subsequently run.

The PCAN-Router is supplied with a demo firmware which forwards CAN messages 1:1 between the two channels at 500 kBit/s. An incoming CAN message causes a change between green and orange of the LED status indication for the respective CAN channel.

The source code for the demo firmware is included on the supplied CD in the directory `Example`.

5 Software

This chapter deals with the installation of the program package WinARM and gives notes about the CAN software library and the demo firmware.

5.1 Installing the WinARM Package

WinARM is collection of tools to develop applications for ARM processors and microcontrollers on Windows platforms. The package includes the GNU GCC compiler for C and C++.

The installation of the WinARM package is done in two major steps, the decompression of the ZIP archive and the setup of additional search paths under Windows.

5.1.1 Decompressing the ZIP Archive

From the supplied CD, directory `Compiler`, decompress the ZIP archive `WinARM-20060606.zip` to `C:\`, including all contained subdirectories. During this action the directory `C:\WinARM` and subdirectories are created.

You can get more information about the WinARM package by starting the file `readme.htm` from the installation directory (`C:\WinARM`).

In the web the WinARM project is found under the following address:
www.siwawi.arubi.uni-kl.de/avr_projects/arm_projects/#winarm

5.1.2 Setting up Additional Search Paths

In order to enable Windows to find the development tools on calling, the according directories must be added to the search paths (environment variable PATH):

```
C:\WinARM\bin;C:\WinARM\utils\bin;
```

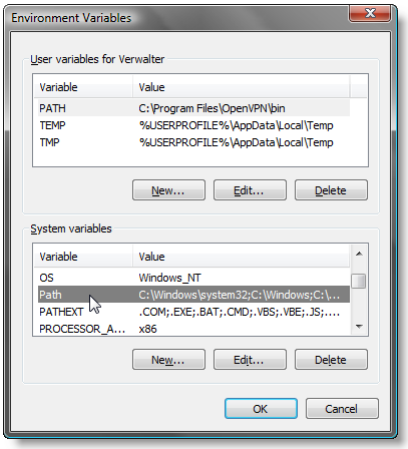
Do the following to setup the additional search paths:

1. Under Windows 2000 and XP make sure that you are logged in as user with administrator privileges.
2. Press the key combination  + Pause.

   Under Windows 2000 und XP the dialog box **System Properties** is shown, under Windows Vista the window **System**.
3. Windows Vista only: Click on **Advanced system settings**. Eventually you must enter an administrator password and confirm to continue.

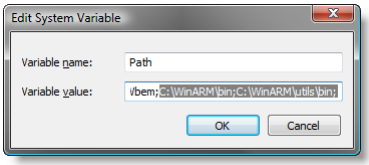
   The dialog box **System Properties** is shown.
4. Open the tab **Advanced** and on this tab click on **Environment Variables**.

   The corresponding dialog box is shown.



5. In the area **System variables** click on the item **Path** and then on **Edit**.

   The dialog box **Edit System Variable** is shown.



6. Add the following character string to the already existing contents of the field **Variable value**:

   ```
   C:\WinARM\bin;C:\WinARM\utils\bin;
   ```

   Make sure that this character string is separated from the previous contents by a semicolon (;) and without a space.

7. Close this and each preceding dialog box with **OK**.

Note: The new search paths are effective only for programs and command prompts that are started afterwards.

5.2 CAN Software Library

The development of applications for the PCAN-Router is supported by the CAN software library `libPCAN-RouterGNU1.6.0s.a` (short: library), a binary file. The library is documented in the header file `can.h`. You find both files in the directory `Example` on the supplied CD.

The current version 1.6 of the library supports all models of the PCAN-Router. You can use software code that is based on previous versions of the library with version 1.6 without any changes.

If your firmware shall be executed on PCAN-Routers with serial numbers starting at 00300, the use of a library with a version of 1.6 or higher is necessary. The table entries of the CAN ID filter differ between the microcontrollers LPC2129 and LPC2194/01. This is taken into account with the mentioned library version.

5.3 Demo Firmware

Beside the library, the directory `Example` on the CD contains the source code for a demo firmware which is implemented on the PCAN-Router on delivery. The demo firmware forwards CAN messages 1:1 between the two CAN channels at 500 kBit/s. An incoming CAN message causes a change between green and orange of the LED status indication for the respective CAN channel.

5.3.1 Compiling the Demo Firmware

Do the following to compile the demo firmware under Windows:

1. Copy the directory `Example` from the supplied CD to the local hard disk.

2. Open a **command prompt** by using the Windows Start menu.

   Alternatively you can press the key combination ⊞ + R and enter `cmd.exe` as program to be executed.

3. At the command prompt change to the directory `Example` that has been copied before.

4. Execute the following command in order to clean-up the target directories (i.e. `.out`) from files that have been generated earlier:

   ```
   make clean
   ```

5. Execute the following command to compile the demo firmware:

   ```
   make all
   ```

   If the compiler has finished without errors (“Errors: none”), you can find the firmware file `Start.bin` in the subdirectory `.out`. This file is then used for firmware upload to the PCAN-Router (see chapter 6 *Firmware Upload* on page 22).

6 Firmware Upload

The microcontroller in the PCAN-Router can be equipped with new firmware in two different ways:

- Via CAN. The scope of delivery includes a special Windows program to copy the firmware from a PC to the PCAN-Router. This is the recommended method for a firmware upload.
- Via the serial interface or the serial connections of the microcontroller. For the latter access to the board is needed.

6.1 Uploading Firmware via CAN

6.1.1 System Requirements

- CAN interface of the PCAN series for the computer (e.g. PCAN-USB)
- Windows 2000 SP4 / XP SP2 / Vista (32 Bit)
- If you want to update several PCAN-Routers connected to the same CAN bus, a unique ID has to be assigned to each PCAN-Router. See section 2.5 *Coding Solder Bridges* on page 12.

6.1.2 Preparing Hardware and Software

Perform the following steps for preparation of the hardware:

1. Switch the PCAN-Router off by disconnecting it from the power supply.
2. Establish a connection between “Boot CAN1” and “+U_{b1}” or “+U_b” at the connectors of the PCAN-Router.

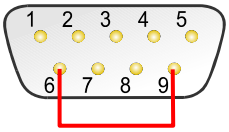


Figure 6: Schematic representation of a connection between the pins "+U_{b1}" (6) and "Boot CAN1" (9) on the CAN 1 D-Sub connector (IPEH-002210 only)

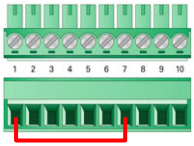


Figure 7: Schematic representation of a connection between the pins "+U_b" (1) and "Boot CAN1" (7) on the screw terminal block (IPEH-002210-P only)

This measure later applies the "Boot CAN1" connection with a high level.

3. Connect the PCAN-Router's CAN bus 1 with a CAN interface connected to the computer.

   Uploading firmware via CAN bus 2 is not possible.

Attention! Risk of short circuit! A CAN cable with D-Sub connectors must not have a connection on pin 6, as it can be seen on 1:1 cables, for example. At other CAN nodes (e.g. a CAN interface of the PCAN series) this line may be applied to the mass. Damage or destruction of the electronics is a possible consequence.

Perform the following steps for preparation of the software:

1. Copy the directory `PcanFlash` from the supplied CD to the local hard disk.

   The contained Windows software that copies the Firmware via CAN (`PcanFlash.exe`) can only be started from a data carrier that is writable.

2. From the copied directory `PcanFlash` execute the program `Pcan2.cpl`.

   The dialog box **Properties of CAN Hardware** is shown.

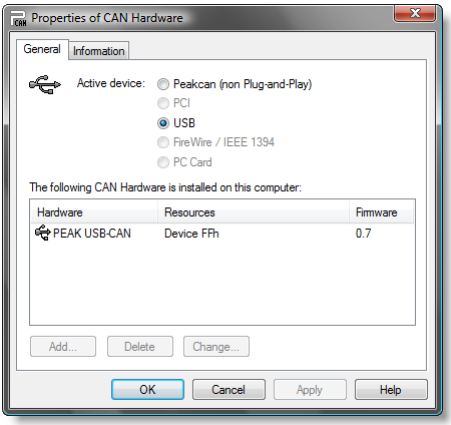


Figure 8: Dialog box for selection of the used CAN hardware (here: PCAN-USB interface)

3. Select the used CAN interface and confirm the selection with **OK**.

4. From the directory `PcanFlash` execute the program `NetCfg32.exe`.

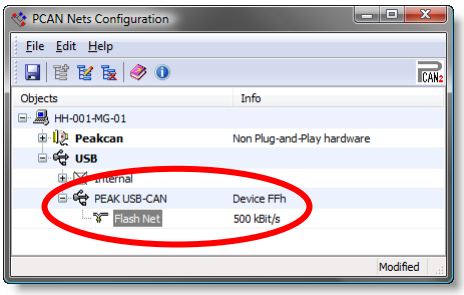


Figure 9: A PCAN net with 500 kBit/s is assigned to the PCAN-USB interface.

5. Check, if a PCAN net with a transfer rate of 500 kBit/s is set up for the used CAN interface. If this is the case, you can continue with the following section Uploading the Firmware.

6. In the tree view right-click on the entry of the used CAN interface and select the command **New Net**.

   The dialog box **Net Properties** is opened.

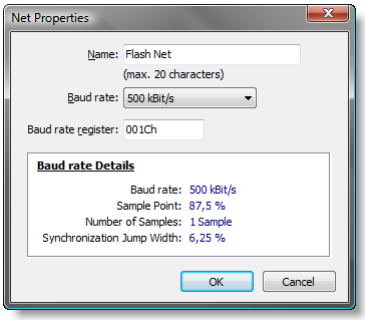


Figure 10: Setting up a new net with a transfer rate of 500 kBit/s

7. Assign an arbitrary name to the new net in the field **Name** (in this example: "Flash Net"), set the transfer rate to 500 kBit/s in the field **Baud rate**, and confirm these settings with **OK**.

8. Execute the menu command **File | Save all** (alternatively:) in order to enable the changes.

6.1.3 Uploading the Firmware

- The process of copying new firmware to the PCAN-Router is as follows:

  1. Ensure that a connection is established between the "Boot CAN1" and "+U_{b1}" or "+U_b" connections of the PCAN-Router (details: see above).

  2. Switch the PCAN-Router on by applying voltage supply.

     Due to the High level at the "Boot CAN" connection, the PCAN-Router starts the CAN boot loader. This can be

identified by two orange LEDs. Starting with version 2 of the CAN bootloader (standard in PCAN-Router modules with serial numbers starting at 00300) the LED “CAN 1” flashes.

3. Run the program `PcanFlash.exe` under Windows from the local hard drive.
4. Click on the (Options) button in order to call up the dialog box.
5. In the **Options** dialog box click on the ... button next to the **File name** field in order to select the requested firmware file to be uploaded.

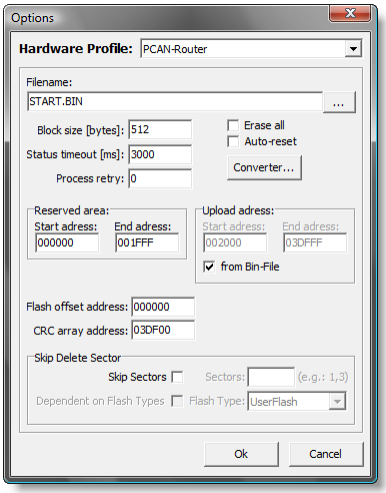


Figure 11: The **Options** dialog box with a selected firmware file

6. Click on the **OK** button.
7. Ensure that the PCAN Flash program is connected to the requested CAN network. Click the (Connect) button in order to change the selection in the dialog box, if required.

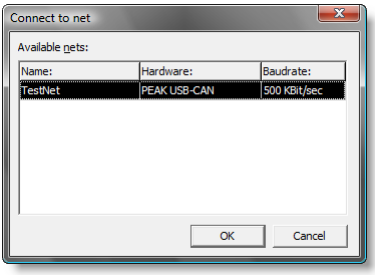


Figure 12: Selection of the CAN network connected to the PCAN-USB interface

8. Click the (Detect) button in order to detect the PCAN-Router connected to the CAN bus.

   An entry for the PCAN-Router appears in the main window.

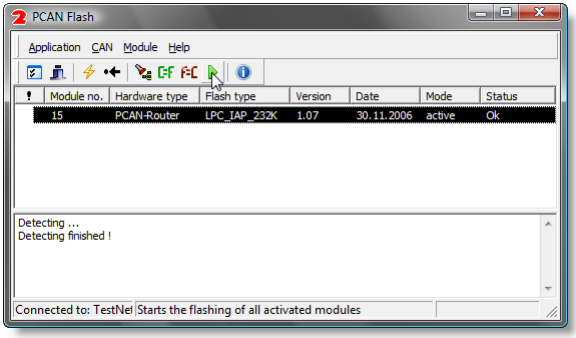


Figure 13: Firmware upload start

9. Select the entry for the PCAN-Router.
10. Click the (Program) button in order to start uploading the new firmware to the PCAN-Router.

    Observe the status display at the bottom of the window. The process was successful, if the last message to appear is “Flashing of module(s) finished!”.
11. Disconnect the power supply from the PCAN-Router.

12. Disconnect “Boot CAN1” from “+U_{b1}” or “+U_b”.

You can now use the PCAN-Router with the new firmware.

6.2 Uploading Firmware via the Serial Connections

This section shows how to initiate the microcontroller’s bootloader. The actual upload process depends on the upload software used which is supplied by a third party and is not described here. You can get more details from our customer support (address on page 2).

Do the following to initiate the microcontroller's bootloader:

1. Switch the PCAN-Router off by disconnecting it from the power supply.
2. Open the housing of the PCAN-Router by removing the screws in order to gain access to the board.
3. Establish a connection on the J4 connector panel between pin 4 (\Boot_ser) and pin 5 (GND).

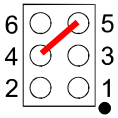


Figure 14: Schematic representation of a connection of the pins “\Boot_ser” (4) und “GND” (5) on connector panel J4

4. Establish a serial connection to the computer or program adapter. This is carried out either via the RS-232 interface (IPEH-002210-P only) or via the serial ports of the microcontroller (TTL levels). See also chapter 2 *Connectors and Coding Solder Bridges* on page 7.

5. Switch the PCAN-Router on by applying voltage supply.

   Due to the Low level on port P0.14 of the microcontroller, the PCAN-Router starts the boot loader for serial copying. Neither LED is illuminated.

7 Frequently Asked Questions (FAQ)

Problem/Question	Answer
Where can I retrieve more information about the microcontrollers LPC2129 and LPC2194/01?	You can download several documents about these microcontroller types via the internet from the homepage of NXP. Address: www.nxp.com

8 Technical Specifications

Power supply	
Voltage supply (+U_b)	7.5 - 26 V DC ± 5%
Current consumption	max. 70 mA at 12 V

Functionality	
Microcontroller	Up to ser. no. 00299: NXP (Philips) LPC2129 Starting at ser. no. 00300: NXP (Philips) LPC2194/01 each with a clock speed of 12 MHz Firmware upload via CAN with special bootloader or serial
Add-on memory	Up to ser. no. 00299: 2 kBit, EEPROM Microchip 24LC02B, I^2C link Starting at ser. no. 00300: 256 kBit, EEPROM Atmel AT24C256B, I^2C link
CAN	2 x High-speed CAN (ISO 11898-2), transceiver 82C250, transfer rates 40 kBit/s – 1 MBit/s (lower transfer rates on request)
LIN	1 LIN channel (on request)
RS-232	RxD and TxD serial connections with RS-232 levels (IPEH-002210-P only)
Digital input (Din0)	Low-active, max. level +U_b (IPEH-002210 only)
Status indication	2 duo LEDs
Connectors	IPEH-002210: 2 x D-Sub connector, 9-pin, assignment according to CiA DS102-2 IPEH-002210-P: 1 x screw terminal block, 10-pin, Phoenix, RM 3.81

Continued on the next page

Measures	
Dimension	Housing: 24 x 55 x 66 mm (15/16 x 2 3/16 x 2 5/8 inches) Board: 17 x 51 x 65 mm (11/16 x 2 x 2 9/16 inches) (see also Appendix B *Dimension Drawing* on page 34)
Weight	IPEH-002210: 100 g (3.5 oz.) IPEH-002210-P: 100 g (3.5 oz., incl. screw terminal block)

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

Appendix A Certificates

A.1 CE

PCAN-Router IPEH-002210(-P)
PEAK-System Technik GmbH

EC declaration of conformity

Notes on the CE Symbol CE

The following applies to the PCAN-Router product IPEH-002210(-P).

EC Directive

This product fulfills the requirements of EC directive 89/336/EEC on "Electromagnetic Compatibility," and is designed for the following fields of application as per the CE marking:

Electromagnetic immunity/emmisson[1]
DIN EN 61326, Release: 2004-05
Electrical equipment for measurement, control and laboratory use – EMC requirements (IEC 61326-1:1997 + IEC 61326-1/A1:1998 + IEC 61326/A2:2000 + Annex E & F of IEC 61326:2002 + corrigendum: 2002);

German version: 61326:1997 + EN1326/A1:1998 + EN61326/A2:2001 + EN61326/A3:2003

Declarations of Conformity

In accordance with the above mentioned EU directives, the EC declarations of conformity and the associated documentation are held at the disposal of the competent authorities at the address below:

PEAK-System Technik GmbH
Mr. Wilhelm
Otto-Röhm-Str. 69
D-64293 Darmstadt
Germany

phone: +49 6151 81 73-20
fax.: +49 6151 81 73-29
info@peak-system.com

Signed this 6th day of August 2007

Appendix B Dimension Drawing

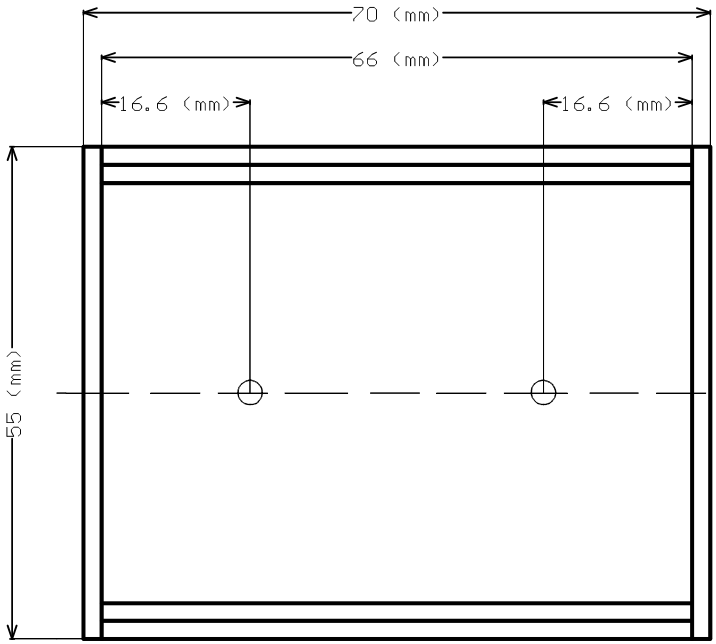


Figure 15: Plan view of the PCAN-Router housing