PLIN-USB

User Manual





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Relevant Products

Product name	Part number
PLIN-USB	IPEH-004052

Imprint

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1 Introduction

The PLIN-USB enables the connection of a Windows computer to a LIN network via USB. The LIN interface supports the LIN protocol according to the standard ISO 17987 and complies with all LIN specifications up to version 2.2. The interface can be operated as a master or a slave.

The monitor application PLIN-View Pro as well as the PLIN programming interface for the development of applications with LIN connection are included in the scope of delivery.

1.1 Properties at a Glance

- LIN interface for the USB connection (Full-Speed mode, compatible with USB 1.1, USB 2.0, and USB 3.0)
- LIN connection (ISO 17987)
- Complies with all LIN specifications (up to version 2.2)
- Bit rates from 1 kbit/s up to 20 kbit/s
- 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
- LIN bus connection via D-Sub, 9-pin
- LIN connection short-circuit-proof against transceiver supply and ground
- NXP LIN transceiver TJA1028T or TI LIN transceiver TLIN1028D
- Galvanic isolation on the LIN connection up to 500 V
- Indicator LED for interface status
- Voltage supply 5 V DC via USB port
- Transceiver supply 6 to 28 V DC via D-Sub, pin 9
- Extended operating temperature range from -40 to +85 °C (-40 to +185 °F)

1.2 System Requirements

- Computer with:
 - Operating system Windows 11 (x64/ARM64), 10 (x64), or Linux
 - a vacant USB port (USB 1.1, USB 2.0, or USB 3.0)
- Power supply with nominal voltage between 6 and 28 V DC

1.3 Scope of Supply

PLIN-USB in plastic casing

Downloads

- Device drivers package for Windows 11 (x64/ARM64), 10 (x64) including:
 - LIN device driver
 - LIN monitor PLIN-View Pro
- Device driver for Linux
- Programming interface PLIN-API for Windows 11 (x64/ARM64), 10 (x86/x64)
- Manual in PDF format

Optional accessories

LIN connection cable for PC LIN interfaces (IPEK-003013)

2 Installation

This chapter covers the software setup for the LIN interface PLIN-USB under Windows and the connection of the LIN interface to the computer.

Install the device drivers package before you connect the LIN interface.

2.1 Install Software and Driver

- 1. Download the device drivers package from our website: <u>www.peak-system.com/quick/DL-Driver-E</u>.
- 2. Extract the file PEAK-System_Driver-Setup.zip
- 3. Double-click the file PeakOemDrv.exe The driver setup starts.
- 4. Confirm the start and the license agreements.
- 5. Follow the program's instructions. When selecting components, select the LIN device driver (other components as needed).

The LIN monitoring software PLIN-View Pro is installed automatically.

2.2 Connection



Note: Do not use a USB extension cable to connect the LIN interface to the computer. Extension cables do not comply with the USB specification.

- Connect the LIN interface to a USB port on the computer or to a USB hub. Windows notifies you about the new hardware and completes the driver installation.
- 2. Check the status LED. If the LED is green, the driver has been successfully initialized.

2.3 Check Operational Readiness

- 1. Open the Windows Start menu.
- Type Peak Settings and press Enter.
 The window PEAK Settings appears.
- 3. Select LIN Hardware.

The connected CAN interface is displayed.

2.4 Connect LIN Bus

The transceiver of the LIN interface requires a power supply between 6 and 28 V DC. This must be provided via pin 9 on the D-Sub connector.

To facilitate the connection, use the optional LIN connection cable for PC LIN interfaces (IPEK-003013).

Pin	Assignment	D-Sub plug on LIN interface
1	None	
2	None	
3	None	1 2 3 4 5
4	LIN	
5	LIN_GND	
6	LIN_GND	
7	None	6 7 8 9
8	None	
9	LIN_V _{Bat}	

2.5 Example Application under Windows

As an example application for accessing the LIN interface, run the LIN monitor PLIN-View Pro from the Windows Start menu.

3 Operation

3.1 Status LED

LED status	Meaning
Green on	There's a connection to a driver of the operating system.
Green slow blinking	The LIN interface is initialized with a valid bitrate. A software application is connected to the LIN interface.
Green quick blinking	Data is transmitted via the connected LIN bus.

3.2 Unplugging the USB Connection

The LIN interface can be disconnected from the computer without further actions. In Windows, the LIN interface is not listed under "Safely Remove Hardware".

3.3 Distinguishing several PLIN-USB

You can operate several PLIN-USB interfaces on a single computer at the same time. For this purpose, the device ID can be determined in order to distinguish the LIN interfaces in a software environment.

PLIN-View Pro

To set the device ID in PLIN-View Pro:

- 1. Open the tab PLIN-USB.
- 2. Enter a hexadecimal number with suffix "h" as the new hardware ID.
- 3. Confirm the entry with Set.

PEAK Settings

To set the device ID in PEAK Settings:

- 1. Select *LIN hardware*. The installed hardware is displayed.
- 2. Click on PLIN-USB.

The view expands and the current ID is displayed in an input field.

- 3. Enter a hexadecimal number with suffix "h" as the new Device ID.
- 4. Confirm the entry with Set.

3.3.1 Identifikation

If you have connected several PLIN-USB interfaces you can identify a single interface via PEAK Settings.

- 1. Select *LIN hardware*. The installed hardware is displayed.
- 2. Click on PLIN-USB.

The view expands and the *Identify* button is displayed.

3. Click on Identify.

The LED of the selected PLIN-USB flashes orange for five seconds.

4 LIN Monitor PLIN-View Pro



The LIN monitor PLIN-View Pro is a Windows software for viewing, sending and recording LIN messages. The software is installed ready for operation under Windows with the installation of the device driver package.

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

Detailed information on the use of PLIN-View Pro can be found in the program window under the menu item *Help*.

4.1 Features

- Display of incoming LIN frames
- Symbolic display of LIN messages (LDF files)
- Master or Slave mode
- Administration and processing of schedule tables
- Configurable recording of LIN frames (trace)
- Display and recording of frame events such as bus sleep, bus wake-up, and overrun
- Automation of various processes with VBScript
- Automation of LIN data and elements with C# scripts; optional use of C# assemblies
- Integrated text editor for C# with syntax highlighting
- Separate views for:
 - Transmit and Receive
 - Trace (data logger)
 - Scripting
 - Connected LIN interface

4.2 Start and Initialize PLIN-View Pro

1. From the Windows Start menu, select PLIN-View Pro.

The main window and the *Connect to* ... dialog box for selecting the LIN hardware appear. The parameters for the LIN interface are set in the dialog window.

Connect to				×	Connect to .					×
PLIN-	Vie	w P	ro	Pro	P	PLIN	Vie	ew P	ro	Pro
Hardware:					Hardware:					
Туре	ID	Device	Channel	Mode	Туре		ID	Device	Channel	Mode
PCAN-USB Pro FD LIN	1Eh	1	1	None	PCAN-US	B Pro FD LIN	1Eh	1	1	None
PCAN-USB Pro FD LIN	FEh	1	2	None	PCAN-US	B Pro FD LIN	FEh	1	2	None
Mode: Master					N	lode: Slave				
Bit rate: 19200				~	Bit	rate: 19200				~
Bit rate detection					Bit rate d	etection				
Timeout: 4000		🔹 ms	Detec	t	Time	eout: 4000		🛉 ms	Dete	ct
Disconnect	ОК		Cancel	Help	Discon	nect	0	ĸ	Cancel	Help

Selection of the hardware as master.

Selection of the hardware as slave.

- 2. If there are several LIN interfaces, select the desired interface. If there are several channels, select the desired channel from the list.
- 3. Determine the operation *Mode* to be used for the LIN connection.

4. If the bit rate is known: Select the bit rate of the LIN bus from the *Bit rate* list. If the bit rate is unknown: Determine the bit rate under *Bit rate detection* with *Detect*.

						Hardware:				
ype		ID	Device	Channel	Mode	Туре	ID	Device	Channel	Mode
PCAN-USB Pro PCAN-USB Pro			1	1	None	PCAN-USB Pro FD LIN PCAN-USB Pro FD LIN		1	1	None None
Mode:	Master				~	Mode: Slave				~
Bit rate:	19200					Bit rate: 19200				
Bit rate detecti Timeout:	4000	nning	ns 🔹	Dete	ct	Bit rate detection Timeout: 4000 Bit rate detection r		ns 🔹	Dete	ct

Note: The LIN interface must not be initialized by any other software.

Bit rate detection as master.

Bit rate detection as slave.

- 5. Confirm the settings with OK.
- 6. Optional: To initialize another channel or LIN interface, open another instance of PLIN-View Pro.

4.3 Receive / Transmit Tab

-			e 🖄 🖓 🦻 🚀 👅 🔳											
5	2 2 2 3 5	5												
Re	eceive / Transmit 🔯 1	race 🔍	Scripting PCAN-USB Pro FD						Та	bles				
	ID Symbol	Len	Data	Pe Co	Direction	CST	Checks	Errors	Glo	obal Frame Table				
	<empty></empty>								ID	Symbol	Pro	Direction	Length	Che.
									00	h	80h	Subscrib	2	Aut.
									01	h	C1h	Subscrib	2	Aut.
									02	'h	42h	Subscrib	2	Aut.
									03	h	03h	Subscrib	2	Aut.
									04	h	C4h	Subscrib	2	Aut.
									05	ih	85h	Subscrib	2	Aut.
									06	ih	06h	Subscrib	2	Aut.
									07	'n	47h	Subscrib	2	Aut.
									06	h	08h	Subscrib	2	Aut.
									09	h	49h	Subscrib	2	Aut.
									04	\h	CAh	Subscrib	2	Aut.
									OE	h	8Bh	Subscrib	2	Aut.
									00	h	4Ch	Subscrib	2	Aut.
									00	Dh	0Dh	Subscrib	2	Aut.
									OE	ih	8Eh	Subscrib	2	Aut.
									OF	h	CFh	Subscrib	2	Aut.
									Pr	operties				
		Len	Data	Co Directi	on CST	En	ors	Trig Comme	nt Fra	me Definition *00h	•			
	<empty></empty>								8	21 🖻				
									-	Changeable				
										Checksum Type		Automatic		
										Direction		Subscriber /	Automati	c Leno
										Event Frame		No		
										Length		2		
										Unconditional ID		00h		
									~	ReadOnly				
										ID		00h		
										Protected ID		80h		
										Symbol				
									Sy	mbol				

In the upper area, the *Receive / Transmit* tab displays the Recieve window for received LIN frames. Depending on the operation mode Master or Slave, the lower area shows the *Transmit* window for the operation mode "Master" or *Publish* for "Slave". If the master requests data from a slave, the slave can publish the data in the LIN frame.

In the *Global Frame Table* all 64 defined LIN frame entries are stored, which can be processed with the LIN interface (LIN ID 0x00 to 0x3F). To send a LIN frame, the underlying frame definition must be adapted in the *Properties* window.

4.4 Transmit a LIN Frame

Depending on the customer's requirements, different scenarios for sending LIN frames are possible.

4.4.1 With LDF (LIN Description File)



Note: An LDF must be provided by the system manufacturer of the LIN bus or created by the customer.

Application examples with an LDF:

- Master with scheduler: The Publisher data is edited in the *Transmit* window and assigned to the *Scheduler* with the Space bar.
- Slave (Listen Only): Selecting "All Listen Only" will receive the data as a silent listener.
- Slave (LIN node simulation): The publisher data of the slave are changed in the *Publish* window. With the Space bar the data is sent to the hardware and thus made available on the LIN bus.
- Master with LIN diagnostic frames: Diagnostic frames 3C/3D are processed via a script to be created by the customer for the LDF used. Examples can be found in the *Help*.

4.4.2 Manually

Manual sending is done according to the connected hardware as master or slave. Frames are configured beforehand for this. For periodic sending, a scheduler can also be created.

6

Note: In the following example, a frame is sent manually from a master as publisher without a scheduler. For automated sending, further expertise in configuring LIN frames and at least one additional LIN node are required.

- 1. Connect your LIN interface as master, see chapter *Start and Initialize PLIN-View Pro*.
- Select the menu command *Transmit* > New Frame. The New frame dialog box appears.

<u>I</u> D (Hex): 00h		\ \
Data (18):		
00 00		
Comment:		
Frame Definition		
ID:		
PID:	80h	
Checksum Type:	Enhanced	~
Direction:	Publisher	~
Length:	2	~

- 3. Select a frame from the *ID* list.
- 4. Select "Publisher" for *Direction*.

The Data fields can now be filled.

- 5. Enter the data of the LIN frame in the Data fields.
- 6. Confirm the entries with OK.

The configured message appears in the *Transmit* window. "0" is displayed in the *Count* column.

Send the selected frame with the menu command *Transmit > Send* or with the Space bar.

The message is sent on the LIN bus and appears in the *Receive* window. "1" for *Transmit* and *Receive* is displayed in the *Count* column.

Change data

- 1. Double-click the message in the *Transmit* window. The *New frame* dialog box appears again.
- 2. Change the data and confirm with OK.

The changed data will be displayed in the Transmit window.

3. Send the frame again.

The data in the *Receive* window is updated. The value in the *Count* column is increased by one for *Transmit* and *Receive*.

4.5 Trace Tab

ecording 336	insmit 🔯 Trac									USB PRO: Tables				
ecoraing 550		6318 Fr								Frame Table				
				-				-	ID	Symbol	Pro	Direction	Length	Che
ime	Direction	ID	Symbol	Length	Data	Checksum	CST	Errors	00h	1	80h	Disabled	2	Enh.,
34,6294	Publisher	05	Control_xxx_LIN	2	80 04	F5	Enhanced		01h	Charles and LUNI	C1h	Subscrib	8	-
34,6774	Publisher	05	Control_xxx_LIN	2	40.08	32	Enhanced			Status_xxx_LIN				Enh
34,7264	Publisher	05	Control_xxx_LIN	2	00 14	66	Enhanced		02h	Error_Status_xx	42h	Subscrib	2	Enh
34,7754	Publisher	05	Control_xxx_LIN	2	00 01	79	Enhanced		03h	Status_xxx_LIN	03h	Subscrib	8	Enh
34,8274	Publisher	05	Control_xxx_LIN	2	80 02	F7	Enhanced		04h		C4h	Disabled	2	Enh
4,8804	Publisher	05	Control_xxx_LIN	2	40 04	36	Enhanced		05h	Control_xxx_LIN	85h	Publisher	2	Enh
4,9274	Publisher	05	Control_xxx_LIN	2	00 18	62	Enhanced		06h		06h	Disabled	2	Enh
4,9754	Subscriber	01	Status_xxx_LIN	8	00 C0 00 00 00 FF 2F 8A	C3	Enhanced		07h		47h	Disabled	2	Enh.
5,0494	Publisher	05	Control_xxx_LIN	2	20 01	59	Enhanced		08h		08h	Disabled	2	Enh.
5,0984	Publisher	05	Control_xxx_LIN	2	80 04	F5	Enhanced		09h		49h	Disabled	2	Enh.
5,1883	Publisher	05	Control_xxx_LIN	2	40 08	32	Enhanced		0Ah		CAh	Disabled	2	Enh.
5,2373	Publisher	05	Control_xxx_LIN	2	00 14	66	Enhanced						-	
5,2863	Publisher	05	Control_xxx_LIN	2	00 01	79	Enhanced		0Bh		8Bh	Disabled	2	Enh
5,3353	Publisher	05	Control_xxx_LIN	2	80 02	F7	Enhanced		0Ch		4Ch	Disabled	2	Enh
5,3833	Publisher	05	Control_xxx_LIN	2	40 04	36	Enhanced		Prope	rties				
5,4533	Publisher	05	Control_xxx_LIN	2	00 18	62	Enhanced		Frame	Definition "02h: Err	or State	e vvv UN*		
5,5143	Subscriber	01	Status_xxx_LIN	8	00 C0 00 00 00 FF 2F 8A	C3	Enhanced				or_stat	13_000_000		
5,5883	Publisher	05	Control_xxx_LIN	2	20 01	59 F5	Enhanced		ê 2					
5,6363 5,6853	Publisher Publisher	05	Control_xxx_LIN	2	80 04 40 08	32	Enhanced Enhanced		Cł	ecksum Type		Enhanced		
	Publisher	05	Control_xxx_LIN		40 08 00 14	66	Enhanced		Di	rection		Subscriber		
5,7363 5,7913	Publisher	05	Control_xxx_LIN	2	00 01	79	Enhanced			ent Frame		No		
5,7913	Publisher		Control_xxx_LIN	2		79 F7				nath		2		
5,8393 5,8873	Publisher	05	Control_xxx_LIN Control xxx LIN	2	80 02 40 04	36	Enhanced Enhanced			ngtri conditional ID		-		
5,9363	Publisher	05	Control_XXX_LIN	2	00 18	62	Enhanced					02h: Error_S	tatus_xxx	Crim
5,9363	Subscriber	05	Status_xxx_LIN	8	00 18 00 C0 00 00 00 FF 2F 8A	62 C3	Enhanced			adOnly				
5,9853 6.0943	Publisher	01	Control_xxx_LIN	2	20 01	59	Enhanced		ID			02h		
6,1423	Publisher	05	Control_XXX_LIN	2	80 04	59 F5	Enhanced		Pr	otected ID		42h		
6,1423	Publisher	05	Control_xxx_LIN	2	40.08	32	Enhanced		Sy	mbol		Error_Status_	cox_LIN	
6,2383	Publisher	05	Control_xxx_LIN	2	40 08	66	Enhanced							
6,2873	Publisher	05	Control_xxx_LIN	2	00 01	79	Enhanced		Symb	ol				
6.3363	Publisher	05	Control xxx LIN	2	80 02	F7	Enhanced			ies the symbol nam a LDF file.	ne of a l	IN-Frame ide	entifier de	fined

The tracer records all sent and received LIN frames if required. The header displays the current status, the complete runtime and the number of recorded LIN frames. Newly recorded LIN frames are appended to the bottom of the list. Depending on the selected setting, recording is done temporarily or directly to a file.

4.6 Scripting Tab

Christed - PLIN-View Pro							- 0 ×
<u>File LIN Transmit Schedules Trace Tools View Help</u>							
🗅 💕 • 🖶 🔗 😪 • 🗧 🖂 🦃 🦻 🌮 🛑 💵 📰 🚱 📆							
5 5 5 5 5		_					
📱 Receive / Transmit 🚥 Trace 🎟 Scripting 🔶 PCAN-USB Pro FD			ables				
Peak.Lin.ViewPro.Scripting.Global V RollingCounter(Int32 id, Int32 length, ref Byte[] data)	~ 🗐 🗸			able "Schedule		1	`
7 /// Inspects data[0] and change data[1] to 0xFF if data[0] is odd.		^		nbol		Slot Type	Resolve Schedule
<pre>/// Otherwise data[1] will be set to 0x00.</pre>			02h 02h		50	Uncondi	<none></none>
19 /// Data[2] and Data[3] is set to the data that is received by ID 0x01. 10 ///			01h 01h	1	50	Uncondi	<none></none>
<pre>20 /// 21 public bool ModuloToggle(int id, int length, ref byte[] data)</pre>							
<pre>if ((id == 0x01) && (length == 4))</pre>							
24							
<pre>15 if ((data[0] % 2) != 0) 16 data[1] = 0xFF;</pre>							
7 else							
data[1] = 0x00;							
<pre>data[2] = Convert.ToByte(rcvData & 0xFF);</pre>							
<pre>data[3] = Convert.ToByte(rcvData / 256); 1 - }</pre>							
12 return true;							
13 L							
14		P	roperties	5			
15 /// <summary></summary>		Ta	able Entry	2 "01h"			×
<pre>36 /// Increments data[0] with 1 until 0xF0 is reached and starts over from 0. 37 /// </pre>			11 2 I I	4			
public bool RollingCounter (int id, int length, ref byte[] data)			Autom				
9 巨 {		11		er Transmit		RollingCount	
<pre>if (id == 0x01)</pre>				ore Transmit		ModuloTogg	
11 E { 12 byte data0 = data[0];			Change			modulo logg	le
<pre>12 byte data0 = data[0]; 13 data0++;</pre>		11	Delay	eable		50	
<pre>if (data0 > 0xF0)</pre>			Delay IDs			50 [01h]	
data0 = 0;		11		e Schedule		<none></none>	
<pre>data[0] = data0;</pre>						<re>vone></re>	
17 - }			Slot Ty	pe		Uncondition	41
19							
0			On After 1	Francoslit			
				fter the publis	her fram	e of the entr	v has been
Line: 40 Column: 20							ion can be used.
					-		
General LIN Script Errors							
General LIN Script Errors I357/26 - Build script code started							
General LIN Script Errors							
General LIN Script Errors I357/26 - Build script code started							
General LIN Script Errors 1357:26 - Build script code started 13:57:26 - Build succeeded							
General LIN Script Errors 1357:26 - Build script code started 13:57:26 - Build succeeded							
General LIN Script Errors I357/26 - Build script code started							

The *Scripting* tab is a text editor with syntax highlighting for the C# programming language. Scripts can be written to automate LIN data and LIN elements. Compiling and deploying a script is done with the check mark in the upper right corner. Feedback, warnings, and errors for the script are displayed in the *Output* section below.

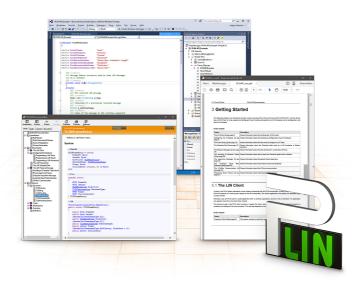
C# assemblies can optionally be included via the menu *Tools > Options > Tab References > Assemblies*. For more details open the *Help* with the key F1.

4.7 LIN Interface Tab

rt Untitled - PLIN-View Pro					- () X
Eile LIN Iransmit Schedules Trace Tools View Help						
🗋 📸 • 🕄 🔗 😪 🕶 🖄 📨 🦈 🛑 💵 🔳 😰 😨						
📮 Receive / Transmit 🚥 Trace 🚥 Scripting 📫 PCAN-USB Pro FD	Tables	5				
	Global	Frame Table				~
PCAN-USB Pro FD	ID	Symbol	Pro	Direction	Length	Che
	00h		80h	Subscrib	2	Aut
Firmware: 3.4.4	01h		C1h	Subscrib		Aut
Consultant and a second s	02h		42h	Subscrib		Aut
Device: 1	03h		03h	Subscrib		Aut
Channel: 1	04h		C4h	Subscrib		Aut
Channel: I	05h		85h	Subscrib		Aut
Hardware ID: 55h Set	06h		06h	Subscrib		Aut
	07h		47h	Subscrib		Aut
0 - FFFFFFh	08h 09h		08h 49h	Subscrib Subscrib		Aut
	09h 0Ah		49n CAh	Subscrib		Aut
	0Bh		8Bh	Subscrib		Aut
	0Ch		4Ch	Subscrib		Aut
	0Dh		0Dh	Subscrib		Aut
	OEh		8Eh	Subscrib		Aut
	OFh		CFh	Subscrib		Aut
	Prope	erties				
	Frame	Definition "00h"				~
	ê Ż					
	~ C	angeable				
	Cł	necksum Type		Automatic		
	Di	rection		Subscriber /	Automati	: Length
	Ev	ent Frame		No		
	Le	ngth		2		
		nconditional ID		00h		
		eadOnly				
	ID			00h		
		otected ID		80h		
	Sy	mbol				
	Symb	al				
	Specif	ies the symbol nam a LDF file.	ne of a l	LIN-Frame ide	entifier de	fined
Connected to PCAN-USB Pro FD LIN (19200) Hardware ID: 55h Device: 1 Channel: 1 Mode: Master Bus: Sleep Overruns: 0						

The LIN Interface tab receives the name of the connected hardware and shows information about the hardware and the firmware used. In this example for the Interface PCAN-USB Pro FD. To distinguish several LIN interfaces of the same type, the *Hardware ID* of the LIN interface can be determined here.

5 PLIN-API



The intended use of PLIN-API requires compliance with the license rights. Read the license agreement for end users at: <u>https://www.peak-system.com/quick/eula</u>

The programming interface PLIN-API provides basic functions for the connection of own programs to the LIN hardware of PEAK-System. PLIN-API is the interface between the program and the device driver. In Windows operating systems this is a DLL (Dynamic Link Library).

The PLIN-API and examples for all common programming languages as well as libraries and help files are available as download package under <u>www.peak-system.com/quick/DL-Develop-E</u>

5.1 Features

- API for developing applications with LIN connection
- Windows DLLs for the development of x86, x64, and ARM64 applications
- Multiple applications can be operated on a physical channel at the same time
- Simple switching between the channels of a PLIN PC hardware
- Internal buffering of messages on software level (system service)
- Precision of time stamps on received messages up to 1 μs
- Allows storing custom data (max. 24 bytes) on the hardware
- Notification of the application through Windows events when a message is received and on plug-in or plug-out of a device
- Function to get error code descriptions in 4 languages

6 Technical Data

USB		
USB mode	USB 2.0 Full-speed	
USB port	Plug type A	
LIN		
LIN standard	2.2, downward-compatible	
LIN connection	D-Sub, 9-pin, LIN signal on pin 4	
Time stamp resolution	1 µs	
Mastertask resoloution	1 ms	
Transceiver	NXP LIN transceiver TJA1028T/3V3/20 or TI LIN transceiver TLIN10283DDRQ	
Bit rates	1 to 20 kbit/s	
Scheduler	Initialized by software, processed by hardware, 8 schedule tables with 256 slots in all configurable	
Galvanic isolation	up to 500 V	
Power supply		
PLIN-USB (without Transceiver)	5 V DC via USB port	
Transceiver	6 to 28 V DC via D-Sub, Pin 9	
Current consumption	USB Transceiver	30 mA max. 20 mA at 12 V
Measures		
Size without cablel (W x L x H)	43 x 86 x 21 mm	
Length USB connection cable	60 cm	
Weight including cable	80 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	

Conformity	
RoHS	EU Directive 2011/65/EU (RoHS 2) + 2015/863/EU DIN EN IEC 63000:2019-05
EMC	EU Directive 2014/30/EU
	DIN EN 55032:2022-08
	DIN EN 55035:2018-04

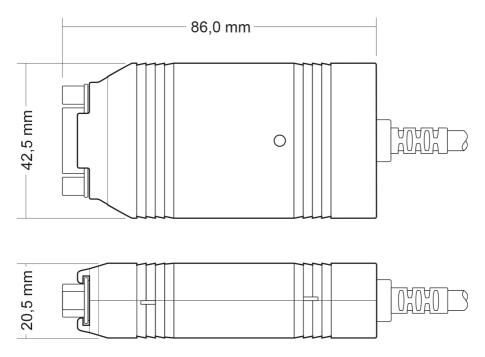
Appendix A CE Certificate



Appendix B UKCA Certificate



Appendix C Dimension Drawings



Appendix D Disposal

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