



HARP-5

Getting started guide V1.3

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1 Introduction

This getting started guide will show you how to setup the HARP-5 to communicate with or monitor the LIN-Bus. Simply follow the next steps.



Advice

This guide is made for new HARP-5 users. If you already have experience with Baby-LIN products or you are an advanced LIN-Bus user then this guide probably is not suited for you.



Advice

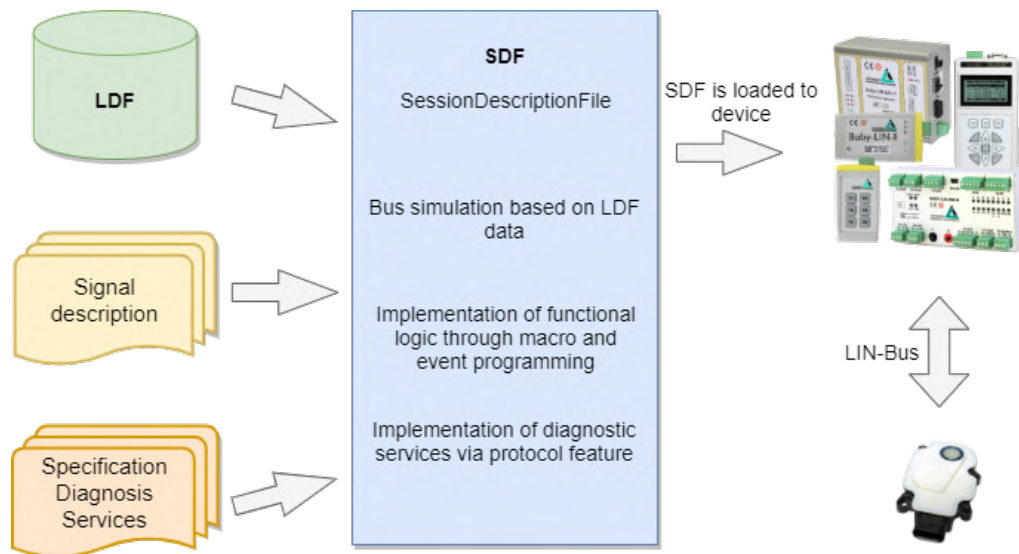
This guide assumes you are using a Microsoft Windows operating system. If you use a Linux operating system please contact us to receive software for your distribution: "Support information"

For this purpose, we will introduce the following components to you:

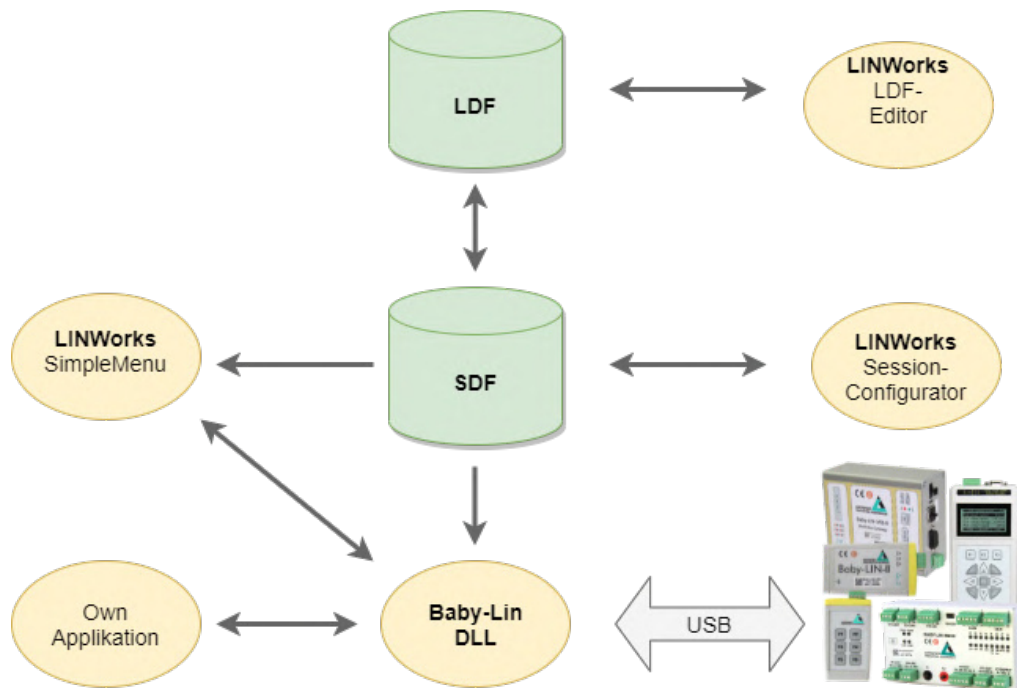
- LDF
- Signal description
- Specification Diagnosis Services

From this information, the SessionDescriptionFile (SDF) can be created. The SDF is the linchpin in LINWorks-based applications.

The following graphic shows the typical workflow of a LIN-based application with our \Productname.



This diagram shows how the individual LINWorks software applications are linked to each other.



2 Getting started

2.1 Introduction

This getting started guide will show you how to create your Lin application using the information from the LDF and the signal descriptions. In the following, you will learn how to create an LDF and integrate it into the SDF. Furthermore, the Unifeid Diagnostic Services will be introduced. After you have successfully created the SDF, the HARP-5 can be operated in standalone mode, LIN bus data can be logged, or macros can be defined for autostart.



Advice

This guide assumes you are using a Microsoft Windows operating system.

2.2 Installation

Before you can start using the HARP-5 you have to install several components of the LINWorks software.

If you have not already downloaded the LINWorks software, please download it now from our website under following link: www.lipowsky.de

The following components are required for this getting started guide:

- Baby-LIN driver
- SessionConf
- SimpleMenu
- LDFedit

3 Session Description File (SDF)

3.1 How to create a LIN application

1. Requirement



A LIN node (slave) and a suitable LDF file are available. An application is to be implemented in which a simulated LIN master allows the node to be operated in a certain way.

2. Requirement



However, the information in the LDF is usually not sufficient. The LDF describes the access and interpretation of the signals, but the LDF does not describe the functional logic behind these signals. Therefore you need an additional signal description which describes the functional logic of the signals.

3. Requirement



If the task also requires diagnostic communication, a specification of the diagnostic services supported by the nodes is also required. In the LDF, only the frames with the respective data bytes are defined, but not their meaning.

These requirements can then be defined and edited together in a Session Description file (SDF).

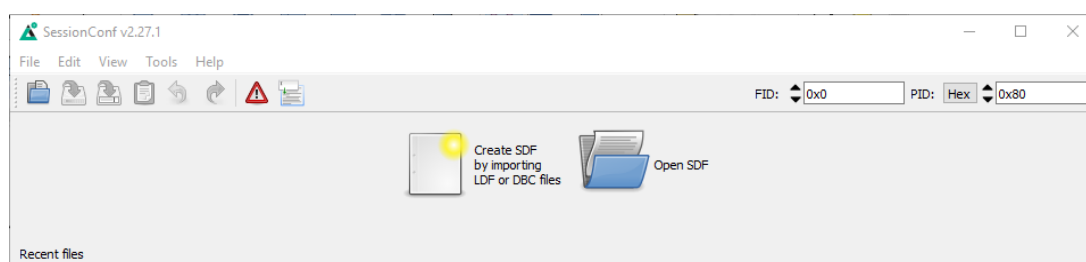
3.2 Introduction

The Session Description file (SDF) contains the bus simulation based on the LDF data. The logic of the individual frames and signals can be programmed by macros and events. In addition to the LDF LIN schedule, further diagnostic services can be implemented in the SDF via protocols.

This makes the SDF the central working point of all LINWorks applications.

3.3 Create a SDF

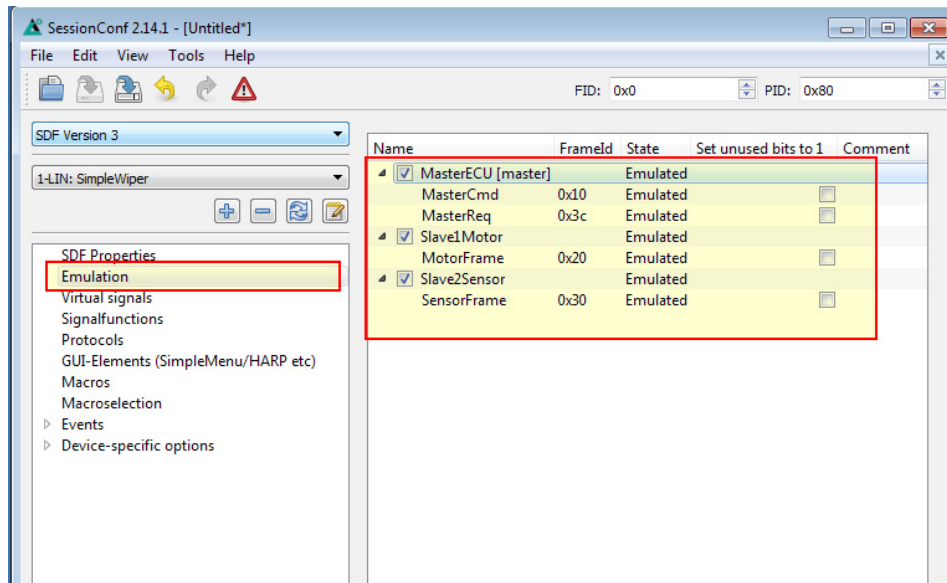
The SessionConf software application is used to create and edit the SDF. For this purpose, an existing LDF is imported.



3.4 Common Setup

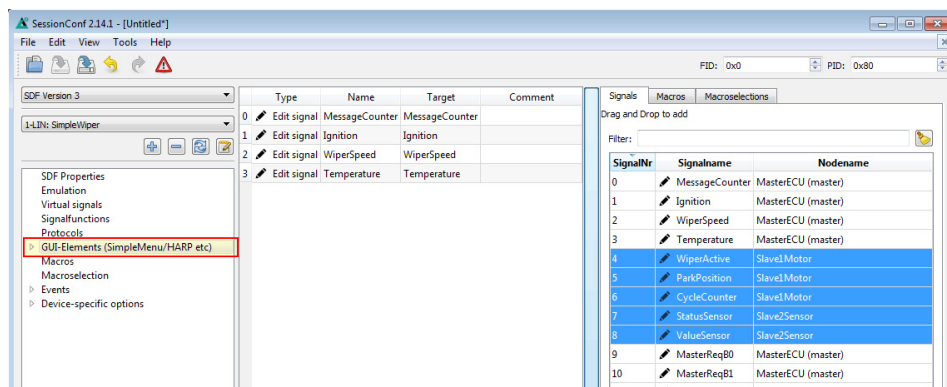
3.4.1 Emulation

Select Emulation in the navigation menu on the left. Here you can select which nodes you want to be simulated by the HARP-5. If you only want to monitor the LIN-Bus, select nothing.



3.4.2 GUI-Elements

Select GUI-Elements in the navigation menu on the left. Here you can add signals you want to monitor.



Advice

There are other ways to monitor frames and signals, but this is a good and configurable starting point.

3.4.3 Virtual signals

Virtual signals can store values just like bus signals, but they do not appear on the bus. They can be used for many different tasks like:

- Temporary values, like counters
- Operands and results from calculations
- Store constants
- etc.

The size of a virtual signal can be set to 1...64 bits. important for use in the protocol feature.

Each signal has a default value that is set when the SDF is loaded.

Name	Length	Initial Value (decimal)	Initial Value (hexadecimal)	Initial Value (ASCII)	Reset on BUS start	Signed	
@SYSBUSSTATE	32	0	0x0		<input type="checkbox"/>	<input type="checkbox"/>	Gets the state of the LIN- or CAN-Bus.
int8	32	0	0x0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
int16	16	0	0x0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
int32	32	0	0x0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
int64	64	0	0x0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
repetitions	32	0	0x0		<input type="checkbox"/>	<input type="checkbox"/>	
runtime	32	0	0x0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
sync	1	0	0x0		<input type="checkbox"/>	<input type="checkbox"/>	
failure	16	0	0x0		<input type="checkbox"/>	<input type="checkbox"/>	

3.4.4 System signals

System signals are virtual signals with reserved names. When a system signal is applied, a virtual signal is created at the same time and linked to a specific behaviour.

In this way, you can access timer, input and output resources and system information.

System Variable Wizard

Choose variable
Choose a system variable to add to the virtual signals list

All Baby-LIN devices

Name	Description
@SYSINFO1	System information
@SYSINFO2	System information
@SYSINFO3	System information
@SYSINFO4	System information
@SYSINFO5	System information
@SYSINFO6	System information
@SYSINFO7	System information
@SYSBUSSTATE	Gets the state of the LIN- or CAN-Bus.
@SYSCFG1	
@SYSCFG2	
@SYSCFG9	
@SYSCFG30	
@SYSCFG31	
@SYSCFG100	
@SYSCFG101	
@SYSCFG203	
@SYSCFG204	
@SYSINTERNAL	
@SYSMACROS_CONCURRENT	

Name: @SYSBUSSTATE
Readonly: No
Reset policy: Default (as defined in virtual signal table)
Description: Gets the state of the LIN- or CAN-Bus.

The following values are defined for the LIN-Bus:
Value **Description**
 0 LIN-Bus voltage is missing
 1 LIN-Bus voltage is available, but no schedule is running
 2 LIN-Bus voltage is available and a schedule is running

The following values are defined for the CAN-Bus:
Value **Description**
 0 CAN-Bus has not been started or was stopped
 1 CAN-Bus was started, but no transmission was acknowledged and no frame was received from another node
 2 CAN-Bus was started and either a transmission was acknowledged or a frame was received from another node

Available on these devices:
All Baby-LIN devices



Advice

For more information and a list of all available system signals, please check the System Signal Wizard in SessionConf.

3.4.5 Macros

Macros are used to combine multiple operations into a sequence. Macros can be started by events or, can also be called from other macros in the sense of a Goto or Gosub. The DLL API calls a macro with the macro_execute command.

Macro number 1

Name: Execute

Parameter count: 0

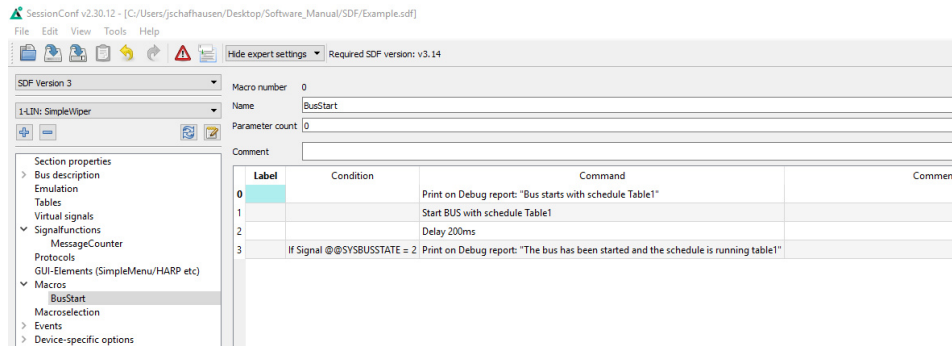
Comment:

Label	Condition	Command	Comment
0		Print on Debug report: "Macro starts"	
1		Gosub macro "BusStart()"	Macro BusStart is being executed
2		Gosub macro "Example(250, 1000)"	Macro Example is executed and is passed the values 250 and 1000 as parameters.
3		Print on Debug report: "Execution was successful"	

All Macro Commands can use signals from the LDF and signals from the Virtual Signal section like the system signals.

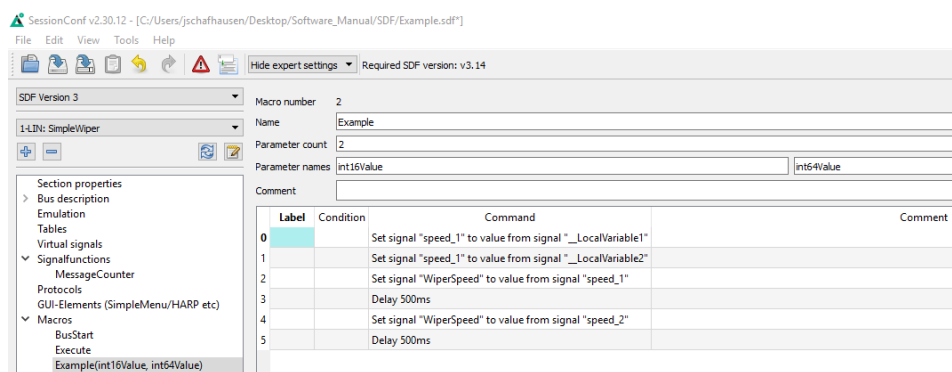


Another important function of the macros is to control the bus. The bus can be started and stopped via macro. Furthermore, the schedule can be selected and the status of the bus can be checked with the help of the system signals.



Each macro always provides 13 local signals:

`_LocalVariable1`, `_LocalVariable2`, ..., `_LocalVariable10`, `_Failure`, `_ResultLastMacroCommand`, `_Return`
 The last 3 provide a mechanism to return values to a callcontext (`_Return`, `_Failure`) or to check the result of a previous macro command. The signals `_LocalVariableX` can be used e.g. as temporary variables in a macro.



A macro can receive up to 10 parameters when called. In the macro definition, you can give these parameters names, which are then displayed on the left in the menu tree in brackets after the macro name. The parameters end up in the signals `_LocalVariable1...10` of the called. If no parameters or less than 10 parameters are passed, the remaining `_LocalVariableX` signals receive the value 0.

3.5 Example SDF

You can download the example SDF under the section "08 | Examples SDF's" under the following link: [GettingStarted_Example.sdf](#)

4 Start the bus communication

4.1 PC mode

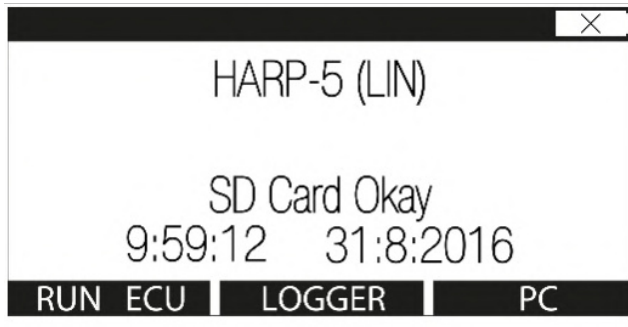
4.1.1 PC mode description

The PC mode enables the HARP-5 to communicate with a PC like other products from the Baby-LIN product family. This means you are able to use the Simple Menu and all of its features as well as writing your own applications using the Baby-LIN-DLL. It is also necessary for updating the firmware.

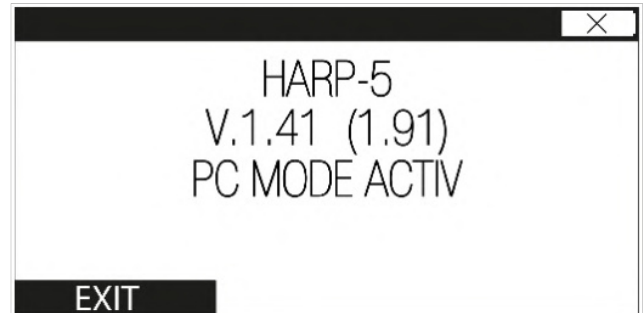
4.1.2 Enable the PC mode

To enable the PC mode of the HARP-5 make sure it is switched on. If you are not in the main menu press ESC repeatedly until you are in the main menu. Then press "F3" to enter the PC mode.

Main menu

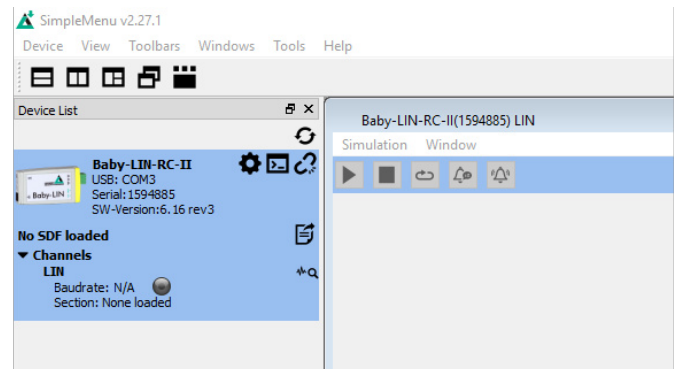
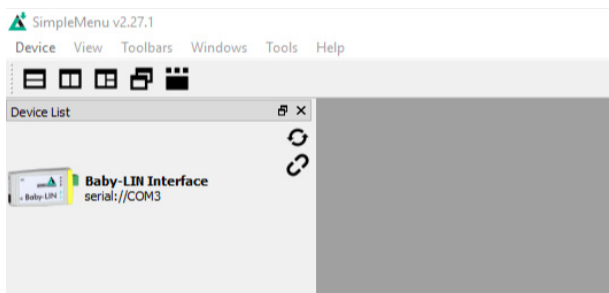


View when the PC mode is enabled

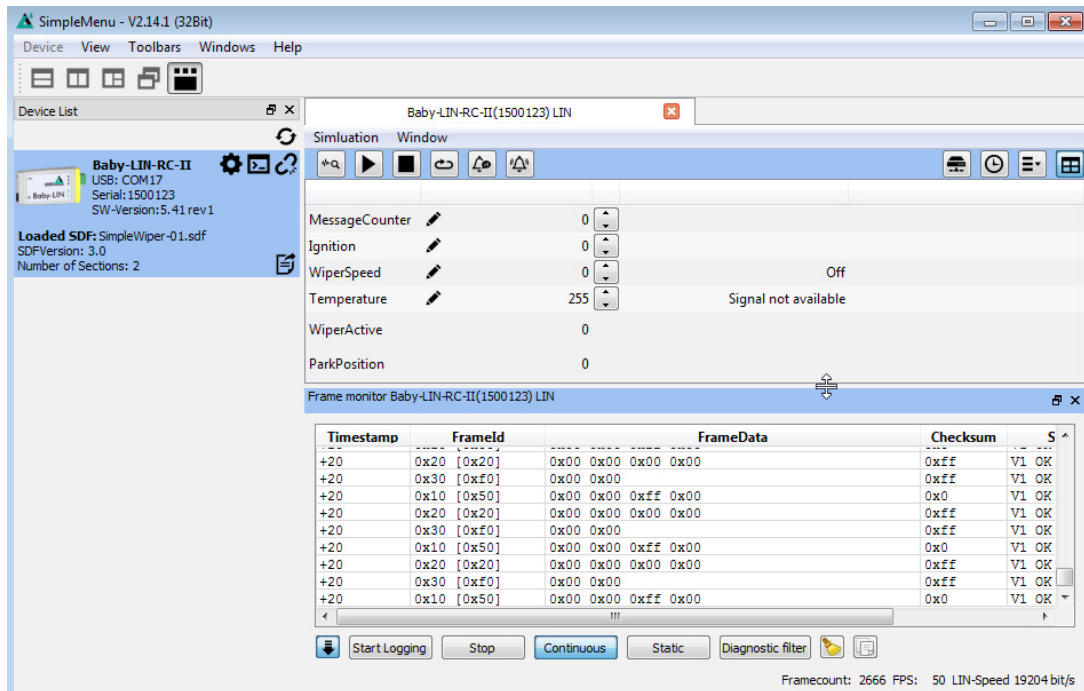


If the PC mode is currently enabled, simply press the "F1" key to exit the PC mode again.

Start the SimpleMenu. You should be able to find your HARP-5 in the device list on the left. Click the connect button and then load the SDF you created earlier.



Now you can see the variables you added to monitor. To start the simulation/monitoring click on the start button.



Now you will see the changes of these signals.

4.2 Stand alone mode

4.2.1 Transfer the SDF

To transfer the SDF to the HARP-5 you require a SDHC card reader. Copy your newly created SDF to the root directory of a SDHC card (One SDHC card is delivered with the HARP-5). Remove the SDHC card from your card reader and plug it into the SDHC card slot of the HARP-5.

4.2.2 Connections

Please establish the following connections:

- Connect the HARP-5 to your LIN- or CAN-Bus.
- If the rechargeable batteries are empty or low you have to connect the provided charging power supply.

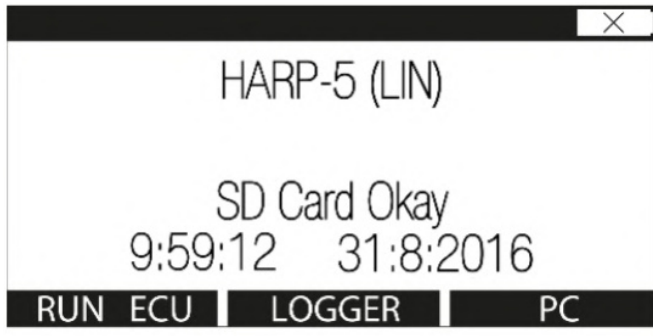


Advice

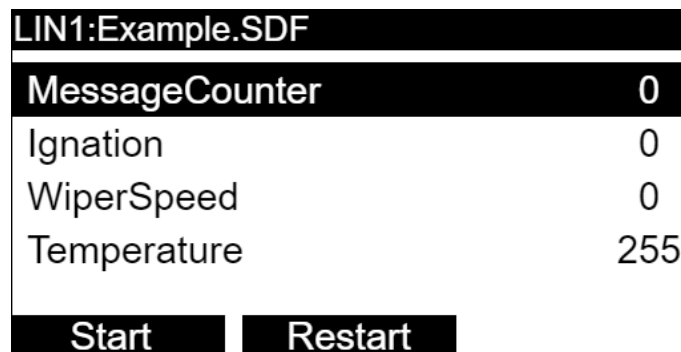
Make sure all other nodes are connected and running properly.

4.2.3 Execute the SDF

In the main menu click the "F1" key to open the "RUN ECU" menu. There you should see the SDF you created earlier. Select it and press the "OK" key.



Now you can see the variables you added to monitor. To start the simulation/monitoring click the "F1" key to select the "START" option.



Now you will see the changes of these signals in real-time.

5 Updates

5.1 Update philosophy

The functionality and features of the HARP-5 are defined by the installed firmware as well as the used versions of the LINWorks and Baby-LIN-DLL.

As we are permanently working on product improvements, the software and firmware are updated periodically. These updates make new features available and solve problems, which have been discovered by our internal tests or have been reported by customers with earlier versions.

All the firmware updates are done in a way, that the updated HARP-5 will continue to work with an already installed, older LINWorks installation. So updating the HARP-5 firmware does not mean, that you necessarily have to update your LINWorks installation as well.

Therefor it is highly recommended to always update your HARP-5 to the latest available firmware version.

We also recommend to also update your LINWorks software and Baby-LIN-DLL, if new updates get available. Since new versions of the SessionConf may introduce new features to the SDF format, it is possible that older firmware, SimpleMenu or Baby-LIN-DLL versions are not compatible. Therefor you should also update them.

If you update your LINWorks it is highly recommended updating the firmware of your HARP-5 to the latest available firmware version as well as distributed the used versions of the Baby-LIN-DLL.

So the sole reason to stay with an older LINWorks version should be, that you use a HARP-5 with outdated firmware version, which you can't upgrade for whatever reason.

It is highly recommended updating the Baby-LIN driver to the latest version.

5.2 Downloads

The latest version of our software , firmware and documents can be found in the download area on our website www.lipowsky.de .



Advice

The **LINWorks** archive contains not only the **LINWorks** software but also the manuals, datasheets, application notes and examples. Only the device firmware packages are not included. The firmware is available as separate package.

Documents such as the data sheets or introductions to LIN bus communication are freely available for download. For all other documents and our LINWorks software you have to log in. If you do not have a customer account yet you can register on our website. After your account has been activated by us you will receive an e-mail and then you have full access to our download offer.

DOWNLOADS

HERE YOU CAN DOWNLOAD DOCUMENTS FREE OF CHARGE.
FOR THE LOCKED CONTENT, PLEASE LOG IN WITH YOUR CUSTOMER ACCESS.

01 | Baby-LIN Software

LinWorks Software | Version 2.31.1 [More](#) ^

File name: LinWorks-PCSoftware-2.X-CD.zip

Latest version of the LINWorks V2 software suite as zip archive. Contains current versions of LINWorks software, Baby-LIN DLL, associated wrappers and Baby-LIN USB drivers as well as data sheets, manuals and program examples.

(376.6MiB) 21.07.30

LOGIN

If you were previously registered in the customer portal, you must register again. All you need is your e-mail address with which you were registered on the portal and a new password. Your account will then be activated directly.

E-Mail:

Password: [Password forgotten?](#)

You do not have an account yet? [Register](#)

REGISTER

E-Mail:

Password (minimum 6 characters):

Repeat password:

I have read and accept the [privacy policy](#).*

I would like to receive the newsletter.

You already have an account? [Log in](#)

5.3 Installation

The LINWorks suite is delivered with a handy setup application. If you already have installed an older version you can simply install the newer versions. The setup application will take care of overwriting the required files. Simply follow these steps:

- Start the "Setup.exe".
- Select the components you want to install.
- Follow the instructions.



Warning

Please stop all running LINWorks applications and disconnect all Baby-LIN devices before starting the setup.



Version incompatibility

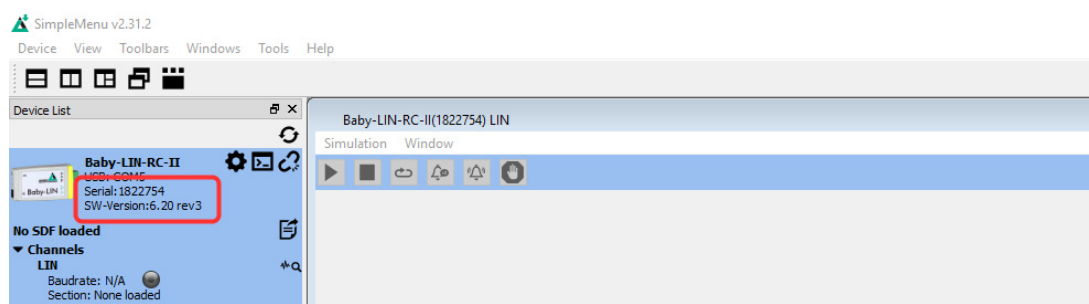
If you have used the SessionConf and SimpleMenu with version V1.x.x, the new version will be installed parallel to the old ones. Therefore you have to use the new shortcuts to start the new versions.

5.4 Check version

If you want to check the current version of the HARP-5 firmware or a LINWorks component the following chapter shows you how it is done:

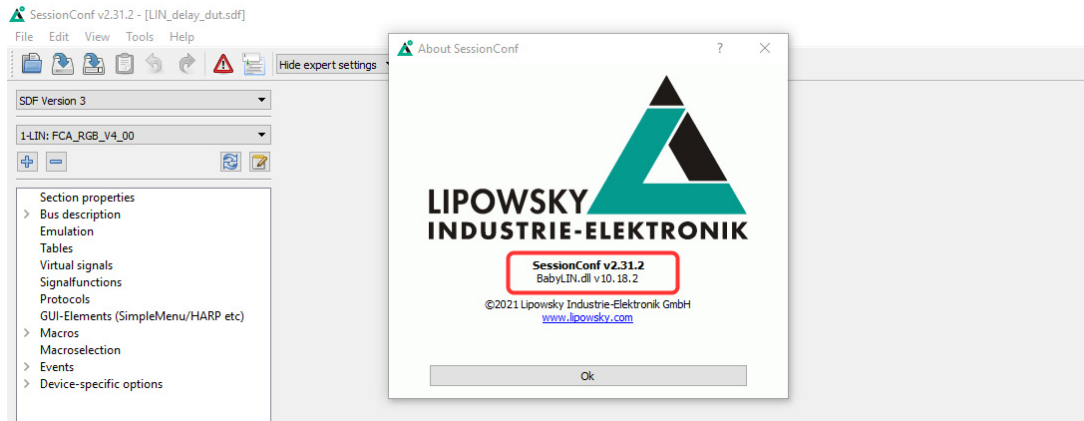
HARP-5 firmware

Start the SimpleMenu and connect to the HARP-5. Now the firmware version is visible in the device list.



LINWorks [LDFEdit SessionConf SimpleMenu LogViewer]

Select the menu option "Help"/"About"/"Info". The info dialog will show the software version.



Baby-LIN-DLL

Call `BLC_getVersionString()`. The version is returned as string.

Baby-LIN-DLL .NET Wrapper

Call `GetWrapperVersion()`. The version is returned as string.

6 Support information

In case of any questions you can get technical support by email or phone. We can use TeamViewer to give you direct support and help on your own PC. This way we are able to sort out problems fast and direct. We have sample code and application notes available, which will help you to make your job.

Lipowsky Industrie-Elektronik GmbH realized many successful LIN and CAN related projects and therefore we can draw upon many years of experience in these fields. We also provide turn key solutions for specific applications like EOL (End of Line) testers or programming stations.

Lipowsky Industrie-Elektronik GmbH designs, produces and applies the Baby-LIN products, so you can always expect qualified and fast support.

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