



Baby-LIN-RC-II

Getting started guide V1.3

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1 Introduction

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

6	Advice This guide is made for new Baby-LIN-RC-II 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.
1	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	e, 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 Baby-LIN-RC-II can be operated in standalone mode, LIN bus data can be logged, or macros can be defined for autostart.



2.2 Installation

Before you can start using the Baby-LIN-RC-II 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.





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

Specification Diagnosis Services 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 Baby-LIN-RC-II. If you only want to monitor the LIN-Bus, select nothing.







SessionConf 2.14.1 - [Untitled*]						E	
File Edit View Tools Help							
🗎 🖭 🟝 🥱 🕐 🛆			FID:	0x0	PI	D: 0x80	
SDF Version 3	Name		FrameId	State	Set unused t	oits to 1	Comment
1-LIN: SimpleWiper	4 🗸	MasterECU [master] MasterCmd	0x10	Emulated Emulated			
	4 🗸	MasterReq Slave1Motor	0x3c	Emulated Emulated			
SDF Properties Emulation	4 🗸	MotorFrame Slave2Sensor	0x20	Emulated Emulated			
Virtual signals Signalfunctions Protocols GUI-Elements (SimpleMenu/HARP etc) Macros Macroselection Events Device-specific options		SensorFrame	0x30	Emulated			

3.4.2 GUI-Elements

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

SessionCont 2.14.1 - [Unitided]										
ile Edit View Tools Help										
🖆 🖭 🚖 🥱 🖄									FID: 0x0	PID: 0x80
XDF Version 3	-	T	Туре	Name	Target	Comment		Signals	Macros Macroselect	ions
LTN: CimelaWiner	50) /	🖋 Edit signal	MessageCounter	MessageCounter		0	orag and Drop	p to add	
,-LIN: Simple viper	_ 1	1 1	🖋 Edit signal	Ignition	Ignition			Filter:		8
	2	2 1	🖋 Edit signal	WiperSpeed	WiperSpeed			ClanalNr	Signalnamo	Nedename
SDF Properties	1	3 1	🖋 Edit signal	Temperature	Temperature			Signative	Signamanie MassanaCounter	Modenance MastarECII (mastar)
Emulation								0	 Wiessagecounter 	Mastereco (master)
Virtual signals								1	Ignition	MasterECU (master)
Signalfunctions								2	WiperSpeed	MasterECU (master)
Protocols	-							3	🖋 Temperature	MasterECU (master)
Macros	_							4	🖋 WiperActive	Slave1Motor
Macroselection								5	ParkPosition	Slave1Motor
> Events								6	CycleCounter	Slave1Motor
> Device-specific options								7	StatusSensor	Slave2Sensor
								8	✓ ValueSensor	Slave2Sensor
								9	✓ MasterRegB0	MasterECU (master)
								10	MasterRegP1	MasterECU (master)
									a mascinequi	musicie co (musici)



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.

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🔏 SessionConf v2.30.12 - [C:/Users/jschafhausen/E)eskt	op/Software_Manual	/SDF/Exam	ple.sdf*]					
File Edit View Tools Help									
🗎 🕭 🖹 🗊 🥱 🥐 🛆 🔛 🛙	-lide (expert settings 💌 Re	quired SDF	version: v3.14					
SDF Version 3	_	Name	Length	Initial Value (decimal)	Initial Value (hevaderimal)	Initial Value (ASCII)	Recet on BUS start	Signed	
1-LIN: SimpleWiper	26	©@SYSBUSSTATE	32	0	0x0	initial value (ASCII)		Gigned	Gets the state of the LIN- or CAN-Bus.
4 - 8 7	27	int8	32	0	0x0				
	28	int16	16	0	0x0				
Section properties	29	int32	32	0	0x0				
> Bus description Emulation	30	int64	64	0	0x0				
Tables	31	repetitions	32	0	0x0				
Virtual signals	32	runtime	32	0	0x0			M	
✓ Signalfunctions MessageCounter	33	sync	1	0	0x0				
Protocols	34	failure	16	0	0x0				

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.





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.

SessionConf v2.30.12 - [C:/Users/jschafhausen/l	Desktop/Software_Ma	nual/SDF/Example.sdf*]	
File Edit View Tools Help			
🗎 🕭 🟝 🗊 🥱 🦿 🗖 🔚	Hide expert settings 🔻	Required SDF version: v3.14	
SDF Version 3	Macro number 1		
1-LIN: SimpleWiper	Name Exe	ute	
4 - 8 2	Parameter count 0		
Section properties	Comment		
 Bus description Emulation Tabler 	Label Conditi 0	on Command Print on Debug report: "Macro starts"	Comment
Virtual signals	1	Gosub macro "BusStart()"	Macro BusStart is being executed
✓ Signalfunctions	2	Gosub macro "Example(250, 1000)"	Macro Emxaple is executed and is passed the values 250 and 1000 as parameters.
MessageCounter Protocols GUI-Elements (SimpleMenu/HARP etc) V Macros BusStart	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.

SessionConf v2.30.12	- [C:/Users/jschafhausen/	Deskt	op/Softwar	re_Manual/SDF/Example.sdf]		
	😏 🕐 🛆 🔚	Hide e	expert settir	ngs 💌 Required SDF version:	v3.14	
SDF Version 3	•	Macr	o number	0		
1-I IN: SimpleWiner	-	Nam	e	BusStart		
ф <u>–</u>	8 🛛	Para	meter count	t 0		
		Com	ment			
Section properties				6 IV		
> Bus description			Label	Condition	Command	Comment
Tables		0			Print on Debug report: "Bus starts with schedule Table1"	
Virtual signals		1			Start BUS with schedule Table1	
 Signalfunctions 		2			Delay 200ms	
MessageCounte	2r	3	If	Signal @@SYSBUSSTATE = 2	Print on Debug report: "The bus has been started and the schedule is running table1"	
Protocols	(ALADD - ALADD - ALAD					
Macros	pleivienu/ HARP etc)					
BusStart						
Macroselection						
> Events						
> Device-specific opt	ions					

Each macro always provides 13 local signals:

_LocalVariable1, _LocalVariable2, ..., _LocalVarable10, _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.

SessionConf v2.30.12 - [C:/Users/jschafhausen	/Des	ktop/Soff	tware_Mar	ual/SDF/Example.sdf*]	
File Edit View Tools Help					
🗎 🏝 🖹 😏 🕐 🛕 🔚	Hide	e expert s	ettings 💌	Required SDF version: v3.14	
SDF Version 3	Ma	acro numbr	er 2		
1-LIN: SimpleWiper	Na	ame	Exa	nple	
 A () () () () () () () () () (Pa	arameter o	ount 2		
	Pa	arameter n	ames int1	SValue	int64Value
Section properties > Bus description	Co	omment			
Emulation		Label	Conditio	n Command	Comment
Tables Virtual cignals	0)		Set signal "speed_1" to value from signal "LocalVariable1"	
 Signalfunctions 	1			Set signal "speed_1" to value from signal "LocalVariable2"	
MessageCounter	2	2		Set signal "WiperSpeed" to value from signal "speed_1"	
Protocols GLIL-Elements (SimpleMenu/HARD etc)	3	1		Delay 500ms	
 Macros 	4	1		Set signal "WiperSpeed" to value from signal "speed_2"	
BusStart	5	j		Delay 500ms	
Execute	1			,	
Example(int lovalue, int64Value)					

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 are passed, the remaining _LocalVariableX signals receive the value 0.

3.4.6 Events

The key field of the Baby-LIN-RC-II makes it possible to link the keystroke with the execution of a macro by using events. This could be used to start or stop the bus communication, completely independently of the SimpleMenu.

The two push buttons of the Baby-LIN-RC-II makes it possible to link the keystroke with the execution of a macro by using events. This could be used to start or stop the bus communication, completely independently of the SimpleMenu.







			Туре		Command	
			Signal		Start	
Eventtype			Macro		Stop Macroselection	
Frame event Signal event Input event	Digital input or key event		V Marro BusStar			
nput/Key			Filter:			
F1		•	MacroNr	Name	mber of comma	Comment
Trigger on			0	BusStart	4	
			1	Everyte	4	
Key pressed / Rising edge		-		checote		
Key pressed / Rising edge		-	2	Example(int16Value, int64Value)	6	
Key pressed / Rising edge			2	Example(int16Value, int64Value) InputEvent	6	

Various events can be configured for all Baby-LIN devices under the Events tab in SessionConf. For the Baby-LIN-RC-II, the input events are additionally available for key presses. In addition to the event, in the 2nd step you can select an action that is to be executed when the button is pressed. In our example, the BusStart macro is executed and LIN bus communication is started.

	Events for BabyLIN-RC (I/II)	
With this method, events and actions can be defined for each individual key.	Event V When F1 is pressed Start macro "BusStart" V When F2 is pressed Start macro "BusStop" V When F3 is pressed Set signal "input_3" to value 1 Start macro "InputEvent" V When F4 is pressed Set signal "input_4" to value 1 Start macro "InputEvent" V When F5 is pressed Set signal "input_5" to value 1 Start macro "InputEvent" V When F6 is pressed Set signal "input_6" to value 1 Start macro "InputEvent"	Comment

3.5 Example SDF

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

Start the bus communication 4

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

Device View Toolbars Windows Tools Help Device List Baby-LIN Interface Serial://COM3	Ҟ SimpleMen	u v2.27.1					
Device List Baby-LIN Interface Serial://COM3	Device View	Toolbars	Windows	Tools	Help		
Baby-LIN Interface		88					
Baby-LIN Interface	Device List			đΧ			
	Baby-UN Bal	by-LIN Inter al://COM3	face	00			

Device List	₽×	Baby-LIN-RC-II(1594885) LIN	
	.	Simulation Window	
Baby-LIN-RC-II USB: COM3 Serial: 1594885 SW-Version:6.16 rev3	\$ E C ?		
No SDF loaded	F		
▼ Channels	2		
	4.0		







🖄 SimpleMenu - V2.14.1 (32Bit) Device View Toolbars Windows Help 8088 Device List đΧ Baby-LIN-RC-II (1500123) LIN × G Window Simluation Baby-LIN-RC-II USB: COM17 Serial: 1500 123 SW-Version: 5.41 rev1 \$ ⊡ ∂ 🚍 🕒 🖃 🆽 *a 🕨 📕 👛 🗘 🛱 Babu LIN 0 🔹 0 🔹 0 🔹 255 🔹 MessageCounter Loaded SDF: SimpleWiper-01.sdf SDFVersion: 3.0 Number of Sections: 2 Ignition . E 1 Off WiperSpeed Temperature ø Signal not available WiperActive 0 0 ParkPosition ÷ Frame monitor Baby-LIN-RC-II(1500123) LIN ₽ × FrameData **S** 4 Timestamp FrameId Checksum V1 0K 0x20 [0x20] 0x30 [0xf0] 0x10 [0x50] 0xff 0xff 0x0 +20 +20 +20 +20 +20 +20 +20 +20 +20 0xff 0xff 0x0 0xff 0x20 [0x20] 0x30 [0xf0] 0x10 [0x50] 0x20 [0x20] 0x30 [0xf0] 0x10 [0x50] 0x00 0x00 0x00 0x00 0xff 0x00 0xff 0x0 Start Logging Stop Diagnostic filter Continuous Static Framecount: 2666 FPS: 50 LIN-Speed 19204 bit/s

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.







5 Updates

5.1 Update philosophy

The functionality and features of the Baby-LIN-RC-II 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 Baby-LIN-RC-II will continue to work with an already installed, older LINWorks installation. So updating the Baby-LIN-RC-II firmware does not mean, that you necessarily have to update your LINWorks installation as well.

Therefor it is highly recommended to always update your Baby-LIN-RC-II 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 Baby-LIN-RC-II 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 Baby-LIN-RC-II 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 , fimrware 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 LINWokrs 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-2X-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	REGISTER	
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 (minimum 6 characters):	
E-Mail:	Repeat password:	
assword: Password forgatten?	I have read and accept the privacy policy.* I would like to receive the newsletter.	
LOG IN You do not have an account yet? Register	REGISTER 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.



If you have used the SessionConf and SimpleMenu with version V1.x.x, the new version will be installed parallel to the old ones. Therefor 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 Baby-LIN-RC-II firmware or a LINWorks component the following chapter shows you how it is done:

Baby-LIN-RC-II firmware

Start the SimpleMenu and connect to the Baby-LIN-RC-II. Now the firmware version is visible in the device list.

SimpleMenu v2.31.2 Device View Toolbars Windows Tools I	Help
8008	
Device List 8 ×	Baby-LIN-RC-II(1822754) LIN Simulation Window
Baby-LIN-RC-II	
No SDF loaded	
LIN +Q Baudrate: N/A Section: None loaded	







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 therefor 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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