

## Baby-LIN-RC-II-B/-C LIN-Bus simulation device with integrated keypad



mands, new system variables, new CRC functions and sub macro calls.

### Operation mode

Any situation that requires communication with a LIN device is a potential field of application for a Baby-LIN-RC-II-B/-C. It is a versatile tool that can be used in research laboratories, test departments and production (EOL applications).

The Baby-LIN-RC-II-B/-C allows for different operation modes to support typical use cases like:

- **Monitor** and log all frames on the bus without the need for a SDF. If a SDF is available signal values can also be monitored.
- **Control** the bus via the **LINWorks** software or customer specific applications by using the **Baby-LIN-DLL**.
- **Program** and store free programmable command sequences in the Baby-LIN-RC-II-B/-C to run it as a **stand-alone** device without the need for a PC. Thus you can run a bus driven ECU in a **durability test** or **EOL applications** without any PC connected.

### Product description

The Baby-LIN-RC-II-B/-C allows controlling LIN-Bus equipped devices by using a standard PC. After installation of the supplied **LINWorks** software, you can connect the Baby-LIN-RC-II-B/-C to a free USB port and access the LIN-Bus devices via LINWorks or your own applications by using the Baby-LIN-DLL.

The Baby-LIN-RC-II-B/-C also has an integrated membrane keyboard with six keys. Each button can be assigned to any LIN-Bus commands. Thus, it is also usable as an autonomous remote control for the LIN-Bus. The Baby-LIN-RC-II-B/-C offers the possibility of using two keys as SHIFT-keys which extends the usable number of six keys up to twelve.

The power for the Baby-LIN-RC-II-B/-C can be supplied either from the USB or the LIN-Bus side. If the device is powered by the LIN-Bus it can be operated without the need for a PC.

The Baby-LIN-RC-II-B/-C has one digital output which can be controlled by the values of the bus signals. For instance the output can be set if a signal equals, unequals, is greater or less than a reference value. It also can be tested, if a certain signal value is within a given area or not.

The Baby-LIN-RC-II-B/-C has a microSD card slot that can be used for logging or running a saved SDF. The associated LED is used to show the logging status as well as the firmware update and boot state.

The Baby-LIN-RC-II-B/-C can handle LIN-Bus voltages in the range of 8-26VDC.

All communication interfaces (LIN-Bus, USB) are galvanically isolated, eliminating interferences between the PC and the board electronics.

The Baby-LIN-RC-II-B/-C unit includes its own 32-bit microcontroller, which takes care of all **time critical** tasks of the LIN-Bus protocol.

The device firmware is field updateable, so the changes of bus specification or upcoming new system features can be adapted easy.

The Baby-LIN-RC-II-B/-C supports **SDF-V3**. This new generation of SDF allows new features like multiple bus sections, conditional macro com-

### Simulation modes

The Baby-LIN-RC-II-B/-C is able to simulate different configurations of LIN-Bus nodes. It is possible to **simulate any number of nodes** ranging from none to all. These are some typical configurations:

- Simulate the **LIN-Bus master** to operate slave nodes.
- Simulate any number of **LIN-Bus slave** nodes.
- Simulate **all nodes** and therefor the complete communication on the bus.
- Simulate all but one node and realize a **residual bus simulation**.
- Simulate no node to **monitor** the bus communication only.

### LIN-Bus properties

The used LIN driver supports bus voltages of 8-26 VDC and can be used up to 115200 Baud. That way even nodes that operate outside the standard limits of the LIN specifications can be controlled with the Baby-LIN-RC-II-B/-C. Supported LIN-versions are V.1.2, V.1.3,...V.2.2. The pull-up resistor of the LIN-Bus driver is switched to 1 kOhm, if the master node is emulated and to 30 kOhm, if only slave nodes are emulated.

The maximum supported signal cable length of the LIN-Bus is 30m but can be less, depending on the bus assembly.

### LINWorks suite

The purchase of a Baby-LIN-RC-II-B/-C includes the license to download the **LINWorks** suite. This suite is a collection of PC software that supports you during the whole workflow.

The **LDFedit** allows the inspection, creation and edit of a LDFFile (LIN Description File).

The **SessionConf** allows the inspection, creation and edit of a SDFFile (Session Description File) and features a file import for LDFFiles (for LIN-Bus simulation). It defines everything needed for a complete simulation of each available bus, e.g. which nodes on each bus are available and which nodes should be simulated by the Baby-LIN-RC-II-B/-C. Moreover it allows defining an application logic. This programming ability is available for each device out of the box.

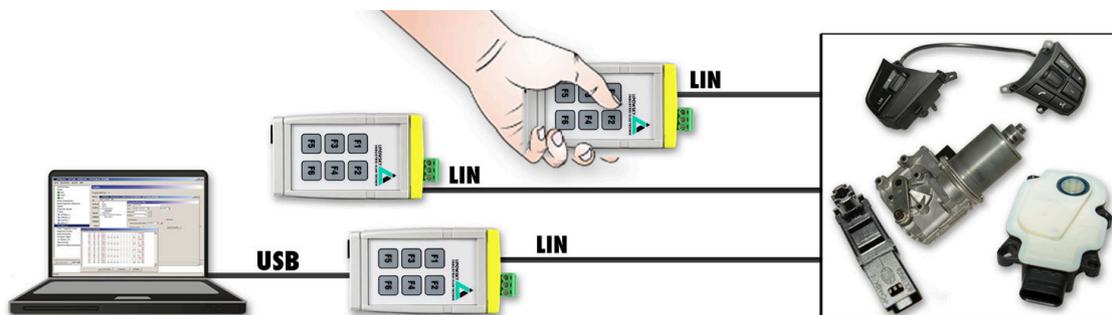
The **SimpleMenu** is used to establish a connection to the Baby-LIN-RC-II-B/-C and upload SDFFiles, change the device target configuration, control

the bus and monitor the frames and signals on the bus. Even without a LDFFile or SDFFile the bus can be monitored and the frames can be logged.

The **Baby-LIN-DLL** allows customers to create their own application and use all features of the Baby-LIN-RC-II-B/-C like controlling and monitoring the LIN- and CAN-Bus interfaces. The **Baby-LIN-DLL** is a native C/↔ C++ DLL. It is available for **Windows, Linux** and **RaspberryPi**. Wrapper for **NET, Python, VB6** and **LabView** are available. Of course we provide examples for all supported languages.

The **LogViewer** can show and convert the log files of the Baby-LIN-RC-II-B/-C as well as the SimpleMenu.

The **LINWorks** software runs on 32 and 64 bit Windows versions.



## Technical Specifications

### Device

- CPU: ARM Cortex-M7, 300 MHz
- Memory: 384kB RAM
- 2 LEDs: Signal bus and error states
- 1 red/green multi colored LED: Signal for firmware update, boot state and microSD card state
- Integrated membrane keyboard with 6 keys
- Real-time clock (battery-backed)
- Power supply: via USB or LIN-Bus power
- Maximum current consumption: 70 mA @ 12 VDC
- Galvanic isolation of all communication interfaces (LIN-Bus, USB)

### Interface: LIN

- 1 LIN-Bus interface available
- LIN-Bus connection via 4 pin connector (MC1,5/4-ST-3,81)
- LIN-Bus supply voltage: 8-26 VDC

- LIN-Bus baud rate: up to 115200 Baud (Support of protocols outside of the LIN specification)
- Supported LIN versions: V1.2, V1.3,...V2.2
- Supported LIN related protocols: Cooling and SAE J2602
- Maximum signal cable length for LIN-Bus: 30 m

### Interface: Digital I/O

- 1 switchable power output (VLIN, Max. 300 mA)

### Interface: USB Device

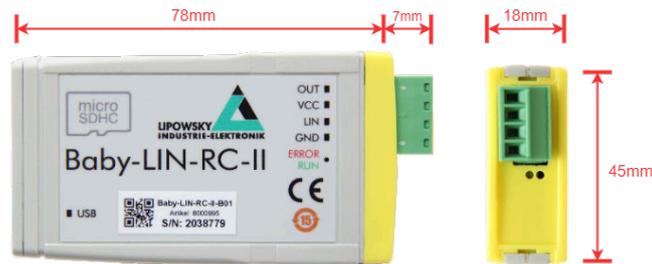
- USB 2.0 interface
- Connection via USB type B-Mini

### Interface: microSD card

- Supported card types: microSD cards, microSDHC cards
- Supported file system: FAT-32, FAT-16
- Maximum card size: 32 GB

### Case

- Degree of protection: IP20
- Operating temperature: -20° - +60° Celsius
- Weight: 40 g
- Case dimensions [mm]: 78 x 45 x 18 (L x W x H) Elements like connectors are not included.



**Advice**

The complete technical specifications can be found in our user manual. It contains amongst other details the following information:

- Connector pin assignment
- Firmware description
- Protocol information
- Electrical characteristics
- SDFFile description
- Migration information
- Electrical characteristics
- Software description
- FAQ

The user manual can be found in our LINWorks download package.

## Hardware requirements

The following hardware is required to operate the Baby-LIN:

Requirement	Purpose
A PC with about 200 MB free hard drive space	Required for the installation of the LINWorks software. Please check the software requirements and use cases.
A free USB port	Required to transfer SDFiles to the Baby-LIN-II and for firmware updates.

## Software requirements

The LINWorks software requires one of the following operating systems:

- Windows XP
- Windows Vista (32 and 64 Bit)
- Windows 7 (32 and 64 Bit)
- Windows 8 (32 and 64 Bit)
- Windows 10 (32 and 64 Bit)

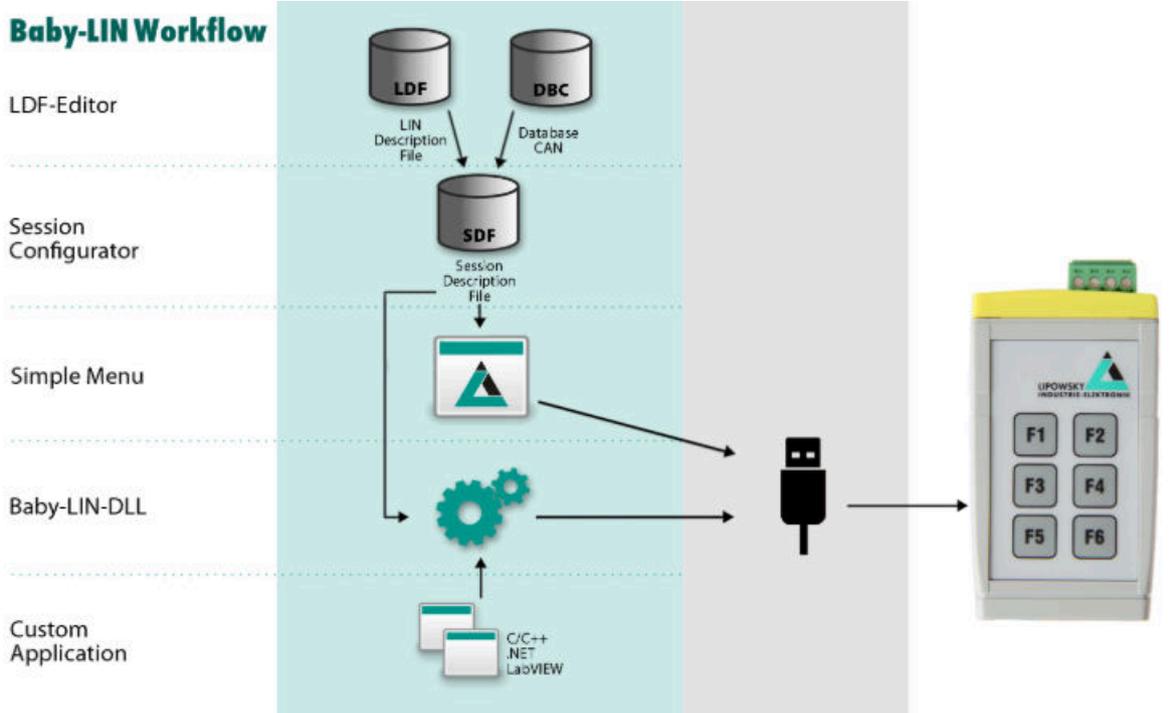


**Version compatibility**

The Baby-LIN-DLL is available for Linux. The exact requirements are available upon request.

Some additional tools available in the LINWorks software suite require an installed .NET Framework v4.0. To install LINWorks components administration privileges are required.

## LINWorks workflow



## Scope of delivery

The delivery of a Baby-LIN-RC-II-B/-C systems includes the following components:

- Baby-LIN-RC-II-B/-C device
- USB 2.0 cable, 1.5m, Type A to type B-Mini
- One 4-pin plug with screw connection (MC 1,5/4-ST-3,81)
- Download license for the LINWorks Suite (includes LINWorks PC software, USB-driver, example files and documentations)

## Ordering information

Item number	Item	Description
8001034	Baby-LIN-RC-II-C01	LIN-Bus simulation device with integrated keypad.



### Advice

Each device includes a download license for the LINWorks application suite. This PC software can be downloaded using our client portal: [portal.lipowsky.de](http://portal.lipowsky.de)



### Tip

Country of origin:  
Customs tariff number:

Germany  
90308900

## Optional hardware components

Item number	Item	Description
3500701	USB 2.0 cable, 1.5m Type A to type B-Mini	This cable connects the Baby-LIN-II to a PC. Such a cable is already within the scope of delivery.
3021304	MC 1,5/4-ST-3,81	4-pin plug component, screw connection with tension sleeve. Cable outlet parallel to plugin direction. Screw direction vertical to plugin direction.
2900130	3V CR1220 Lithium button cell	This button cell is used to power the RTC clock of the Baby-LIN-RC-II. A fresh cell can power the RTC clock for over 9Years years.
3000681	16 GB microSDHC card	This microSDHC card can be used to log the LIN-Bus communication.

## Optional voucher codes

Item number	Item	Description
8000943	Option BL-microSD-Card	License code for Baby-LIN-RC-II to activate logging to the microSD card.



### Advice

All voucher codes can be converted using the option shop: [www.optionshop.de/lipowsky](http://www.optionshop.de/lipowsky)

## Optional software components

Item number	Item	Description
9004210	Customer specific installation.	Installation of customer specific SDFile version and/or installation of license activation key.
9103010	LINWorks CD	The LINWorks archive with PC software for all Baby-LIN products on a physical medium (CD).



### Tip

You can order the Baby-LIN-RC-II as test device. Try it for one week and convince yourself. Please contact us over [info@lipowsky.de](mailto:info@lipowsky.de).

## Distributors

Area	Country	Distributor	Website	Phone	E-Mail
Asia		Hongke Technology Co. LTD	<a href="http://www.hkaco.com">www.hkaco.com</a>	+86 20 3874 4538	<a href="mailto:sales@hkaco.com">sales@hkaco.com</a>
		Microport Computer Electronics Inc.	<a href="http://www.microport.com.tw">www.microport.com.tw</a>	+886 6 330 3000	<a href="mailto:inquiry.microport@gmail.com">inquiry.microport@gmail.com</a>
		KMDATA Inc.	<a href="http://www.kmd.co.kr">www.kmd.co.kr</a>	+82 2 3281 0333	<a href="mailto:daniel@kmd.co.kr">daniel@kmd.co.kr</a>
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Worldwide		Lipowsky Industrie-Elektronik GmbH	<a href="http://www.lipowsky.com">www.lipowsky.com</a>	+49 6151 935910	<a href="mailto:info@lipowsky.de">info@lipowsky.de</a>

More details about our distributors can be found on our website under the heading [Distributors](#).

## Product disposal



After the product is no longer used, it must be disposed of separately from household waste at a designated recycling site. All kind of batteries must be removed from the device and disposed separately. Furthermore, you can also return the device to us for proper disposal, you only have to bear for the shipping costs. Please use this address:

Lipowsky Industrie-Elektronik GmbH  
Device disposal  
Römerstr. 57  
64291 Darmstadt  
Germany