

Baby-LIN-RM-II

Multibus simulation device with I/O interface



Product description

The Baby-LIN-RM-II allows controlling LIN- and CAN-Bus equipped devices by using a standard personal computer. After installation of the supplied **LINWorks** software, you can connect the Baby-LIN-RM-II to a free USB port, and access the LIN- and CAN-Bus devices via LINWorks or own programs by using the Baby-LIN-DLL.

In addition LIN and CAN devices can be controlled using **digital signals** only. This enhances testing facilities based on a **PLC** (Programmable Logic Controller) by a LIN- or CAN-Bus without much effort. This can be extremely beneficial for facilities with long term testing.

Two of the digital inputs can read, scale and map **PWM** (Pulse-width modulation) signals to bus signals. Furthermore the modules digital outputs can be controlled by the values of the bus signals. For instance an 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. All digital outputs can be configured to output **PWM** (Pulse-width modulation) signals as well.

In addition the Baby-LIN-RM-II offers two **programmable buttons**. They may for example be used to start and stop the LIN- or CAN-Bus communication. Furthermore they can be used for many more functions.

The Baby-LIN-RM-II can handle bus voltages in the range of 8-26 VDC.

All communication interfaces (LIN- and CAN-Bus, Digital inputs, USB) are **galvanically isolated**, eliminating interferences between the PC and the board electronics. Only the digital outputs use the ground of the board's logic supply.

The Baby-LIN-RM-II unit includes its own 32-bit microcontroller, which takes care of all **time critical** tasks of the LIN- and CAN-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-RM-II can be enabled to support **SDF-V3** if an optional voucher code is purchased. This new generation of SDF allows new features like multiple bus sections, conditional macro commands, new system variables, new CRC functions and sub macro calls.

Operation modes

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

The Baby-LIN-RM-II 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-RM-II 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.

Simulation modes

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

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

Simulations for the LIN- and CAN-Bus can be done simultaneously.

LIN- and CAN-Bus properties

The used LIN driver supports bus voltages of 8-26 VDC and can be used to up to 125 kBaud. That way even nodes that operate outside the standard limits of the LIN specifications can be controlled with the Baby-LIN-RM-II. Supported LIN-versions are V.1.2, V.1.3,...V.2.2.

One CAN-Bus of the Baby-LIN-RM-II is designed as a high-speed interface according to ISO-11898 with a SN65HVD251 driver.

One CAN-Bus of the Baby-LIN-RM-II utilizes a fault tolerant low-speed physical layer according to ISO-11519 with a TJA1055T driver.

The maximum supported signal cable length of the LIN- and CAN-Bus is 30m.

LinWorks suite

The purchase of a Baby-LIN-RM-II 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 LDFile (LIN Description File).

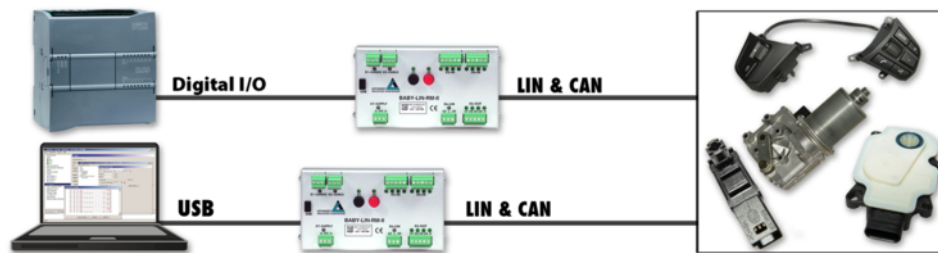
The **SessionConf** allows the inspection, creation and edit of a SDFFile (Session Description File) and features a file import for LDFFiles (for LIN-Bus simulation) and DBC files. It defines everything needed for a complete simulation of each available bus, e.g. which nodes on each bus are available and which nodes should be simulated by the Baby-LIN-RM-II. 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-RM-II and upload SDFFiles, change the device target configuration, control the bus and monitor the frames and signals on the bus. Even without a LDFFile/DBC file/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-RM-II like controlling and monitoring the LIN- and CAN-Bus interfaces. The **Baby-LIN-DLL** is a native **C/C++** DLL. A wrapper for **.NET** applications is also provided as **LabView** files. Examples are available for all supported languages.

The **LogViewer** can show and convert the log files of the SimpleMenu.

The **LINWorks** software runs on 32 and 64 bit Windows versions. The Baby-LIN-DLL is also available as **Linux version** upon request.



Technical Specifications

Device

- CPU: ARM Cortex-M4, 168 MHz
- Memory: 4 MB RAM
- 4 red/green multi colored LED: Signal device and LIN- and CAN-Bus states
- 2 LEDs: Used as switch button indicator or freely programmable
- 12 LEDs: Used as signal indicator for digital input and outputs
- 2 freely programmable push buttons
- Power supply: 8-32 VDC
- Power supply via 3 pin connector (MC 1,5/ 3-ST-3,81)
- Maximum current consumption: 250 mA @ 24 VDC
- Galvanic isolation of all communication interfaces (LIN- and CAN-Bus, Digital inputs, USB, Exception: Digital outputs)

Interface: LIN

- 1 LIN-Bus interface
- LIN-Bus connection via 3 pin connector (MCVR 1,5/ 3-ST-3,81)
- LIN-Bus supply voltage: 8-26 VDC
- LIN-Bus baud rate: up to 125 kBaud (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: CAN

- 1 CAN-Bus as high speed interface (CAN-HS) according to ISO-11898 available on hardware but not activated, voucher code required
- 1 CAN-Bus as fault tolerant low speed interface (CAN-LS) according to ISO-11519 available on hardware but not activated, voucher code required
- CAN-HS-Bus connection via 3 pin connector (MCVR 1,5/ 3-ST-3,81)
- CAN-LS-Bus connection via 3 pin connector (MCVR 1,5/ 3-ST-3,81)
- Maximum signal cable length for CAN-Bus: 30m

Interface: USB Device

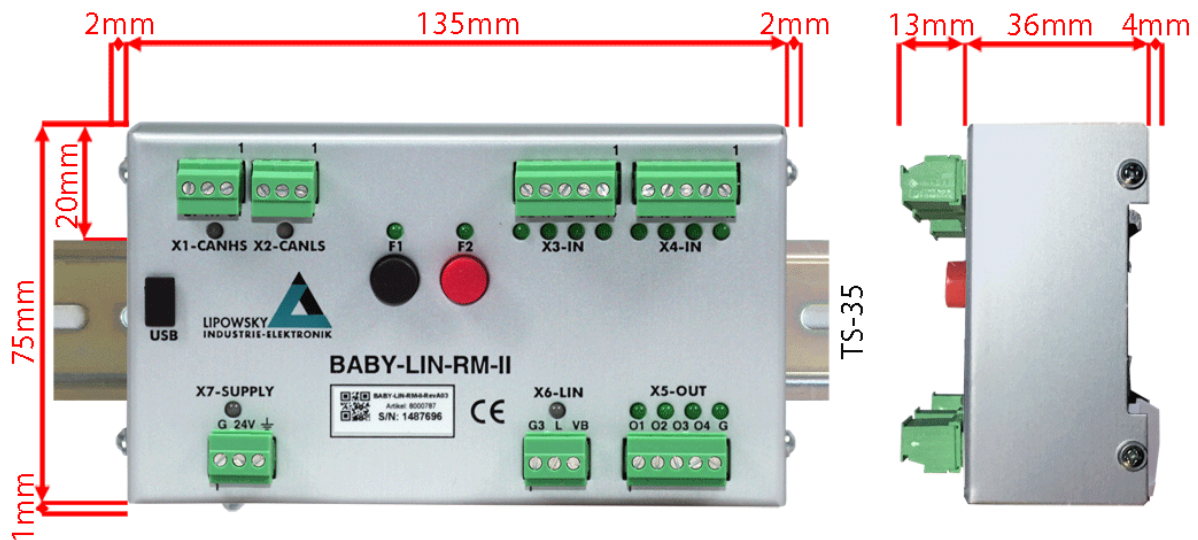
- USB 2.0 interface
- Connection via USB type B-Mini

Interface: Digital I/O

- 8 digital inputs
- 4 digital outputs
- Digital I/O available via 3 5 pin connectors (MCVR 1,5/ 5-ST-3,81)
- 2 digital inputs can be used to read PWM signals
- All digital outputs can be used to output PWM signals

Case

- Degree of protection: IP20
 - Operating temperature: -20° - +65° Celsius
 - Weight: 250 g
 - Case dimensions [mm]: 136 x 76 x 36 (L x W x H)
- Elements like connectors, buttons, and the top hat rail mounting adapter are not included.
- Mounting: Top hat rail (TS 35):



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-RM-II.
	Required for firmware updates.
Power supply: 8-32 VDC	Voltage supply of the Baby-LIN-RM-II.

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)
- Linux



Version incompatibility

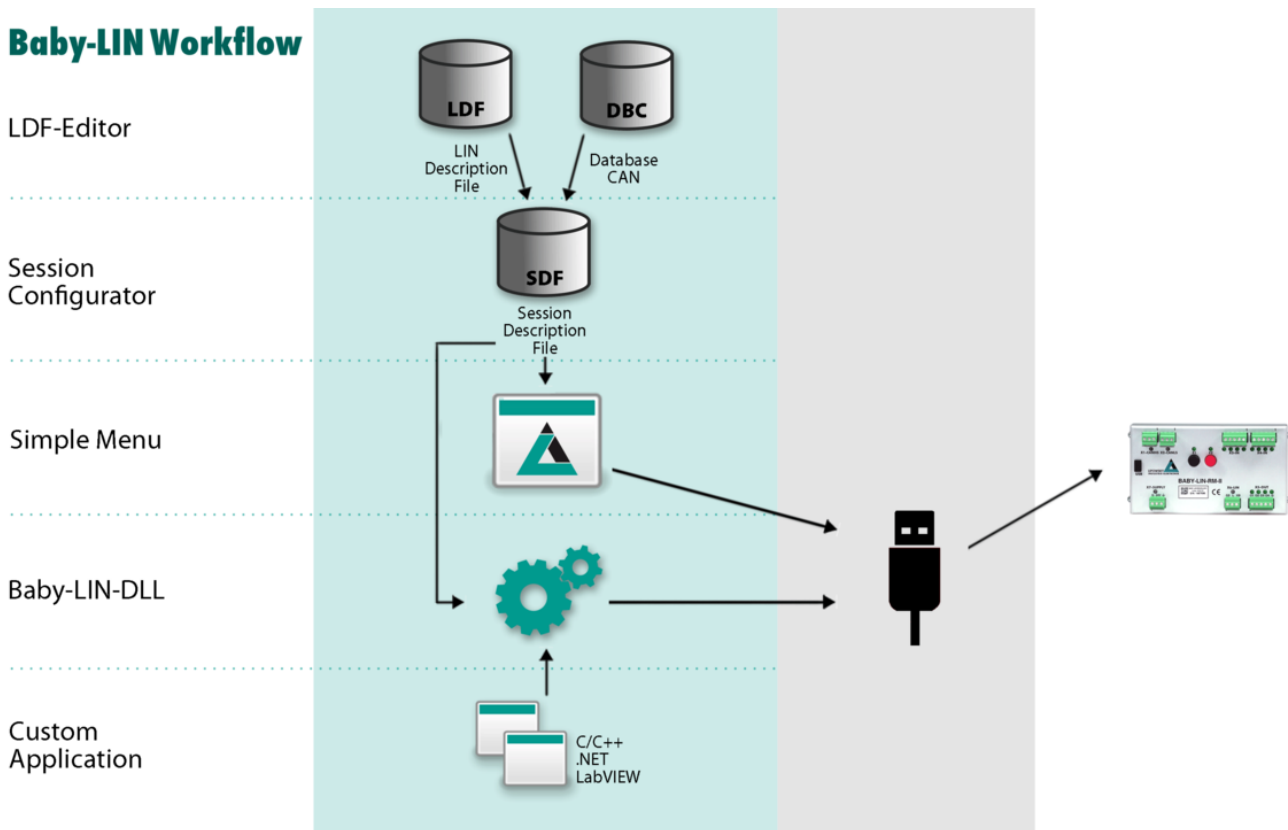
For Linux only the Baby-LIN-DLL is available upon request. This allows writing your own custom applications on Linux. All other LINWorks components are only available on Windows operating systems.

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

Baby-LIN Workflow



Scope of delivery

The delivery of a Baby-LIN-RM-II systems includes the following components:

- Baby-LIN-RM-II device
- USB 2.0 cable, 1.5m, Type A to type B-Mini
- Plug components for all terminals:
 - 4 3-pin plugs with screw connection (MCVR 1,5/ 3-ST-3,81)
 - 3 5-pin plugs with screw connection (MCVR 1,5/ 5-ST-3,81)
- Download license for the LINWorks Suite (includes LINWorks PC software, USB-driver, example files and documentations)

Ordering information

Main device		
Item number	Item	Description
8000873	Baby-LIN-RM-II	Multibus simulation device with I/O interface



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



Tip

Country of origin:
Customs tariff number:

Germany
90308930

Optional hardware components		
Item number	Item	Description
8000855	IF-OUT-N2P-4Ch	Adapter for 4 galvanically isolated high side outputs for the Baby-LIN-RM-II.
3500701	USB 2.0 cable, 1.5m Type A to type B-Mini	This cable connects the Baby-LIN-RM-II to a PC. Such a cable is already within the scope of delivery.
3021130	MCVR 1,5/ 3-ST-3,81	3-pin plug component, screw connection with tension sleeve. Cable outlet vertical to plugin direction. Screw direction parallel to plugin direction.
3021140	MCVR 1,5/ 4-ST-3,81	4-pin plug component, screw connection with tension sleeve. Cable outlet vertical to plugin direction. Screw direction parallel to plugin direction. Used only by the IF-OUT-N2P-4Ch adapter, not by the Baby-LIN-RM-II itself.
3021150	MCVR 1,5/ 5-ST-3,81	5-pin plug component, screw connection with tension sleeve. Cable outlet vertical to plugin direction. Screw direction parallel to plugin direction.



Advice

All devices are delivered with a full set of plug components. An extra order is necessary for replacement or configuration purposes only.

Optional voucher codes		
Item number	Item	Description
8000800	Option BL-HARP SDFV3-LIN	License code for Baby-LIN-RM-II to support enhanced LIN functions of LINWorks. The enhanced functions are available using the new SDF v3 file format.
8000810	Option BL-HARP SDFV3-CAN-HS	License code for Baby-LIN-RM-II to support the CAN-High-Speed bus interface. The enhanced functions are available using the new SDF v3 file format.
8000820	Option BL-HARP SDFV3-CAN-LS	License code for Baby-LIN-RM-II to support the CAN-Low-Speed bus interface. The enhanced functions are available using the new SDF v3 file format.
8000831	Option-BL-HARP-Jumbo Frames	License code for Baby-LIN-RM-II to support the jumbo frame feature (frames with more than 8 data bytes).



Advice

All voucher codes can be converted using the option shop: www.optionshop.de/lipowsky

Optional software components		
Item number	Item	Description
9004210	Customer specific installation.	Installation of customer specific SDF file version and/or installation of license activation key.
9103010	LINWorks CD	PC-Software for all BABY-LIN devices on a physical medium (CD).

Distributors

Area	Country	Distributor	Website	Phone	E-Mail
Asia		Hongke Technology Co. LTD	www.hkaco.com	+86 20 3874 4538	sales@hkaco.com
		Microport Computer Electronics Inc.	www.microport.com.tw	+886 6 330 3000	inquiry.microport@gmail.com
		KMDATA Inc.	www.kmd.co.kr	+82 2 3281 0333	daniel@kmd.co.kr
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		The Debug Store	www.thedebugstore.com	+44 1490 430526	sales@TheDebugStore.com
Worldwide		Lipowsky Industrie-Elektronik GmbH	www.lipowsky.com	+49 (0) 6151 / 93591 - 0	info@lipowsky.de

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