

Baby-LIN-MB

Multibus simulation device with multi interface options



Product description

The Baby-LIN-MB is a modular RS-232/Ethernet to LIN-Bus **gateway**, which allows to control LIN-Bus driven ECU's from any host (e.g. PLC) equipped with RS232, Ethernet.

The Baby-LIN-MB features slots for up to 3 piggyback extensions. These MIF (mounted interface) extensions allow for a **modularisation** of the device. Therefor the device can meet strongly varying requirements. The following MIF modules are available:

- MIF-LIN: adds 1 additional LIN-Bus interfaces
- MIF-DIO: adds 3 digital inputs and 3 shared digital inputs/outputs
- MIF-RS232: adds a RS-232 serial interface

The basic version of the Baby-LIN-MB hardware is delivered with:

- 1 LIN-Bus interface (uses 1 MIF slot)
- 1 RS-232 interface (uses 1 MIF slot)
- 1 free MIF slot

Please do not hesitate to request **custom configurations** of the base device and MIF extensions.

The LIN-Bus configurations are defined in a custom SDF. The process can be controlled by a simple **ASCII command protocol**, issued via the built-in RS-232 or Ethernet interface. The command protocol uses an extensible **plug-in system**. Therefor new plug-ins can be purchased with special new features or customer specific commands.

A real-time operating system based on the freely available and well documented TNKernel (adapted by us to the CPU and successfully tested) allows for easy adaption of network protocols and remote support options.

Multiple SDF's can be stored on the **internal SD card**. Most of the 4 GB flash drive are reserved for user specific SDF's.

An **USB 2.0 host** interface is integrated in the device. USB drives and USB card readers with FAT file systems can be used. This allows for easy update and SDF upload mechanisms. Additionally log data can be written and easily transferred the PC.

The Baby-LIN-MB can handle LIN-Bus voltages in the range of 8-36 VDC.

All communication interfaces (LIN-Bus, Ethernet, RS-232) are **galvanically isolated**, eliminating interferences between the PC and the board electronics.

The Baby-LIN-MB 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.

Operation modes

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

The Baby-LIN-MB 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 customer specific applications by communicating over LAN or RS-232.
- **Program** and store free programmable command sequences in the Baby-LIN-MB 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-MB 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 8-36 VDC and can be used to up to 200 kBaud. That way even nodes that operate outside the standard limits of the LIN specifications can be controlled with the Baby-LIN-MB. 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 30 kΩ, if the master node is emulated and to 1 kΩ, if only slave nodes are emulated.

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

LINWorks suite

The purchase of a Baby-LIN-MB 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-MB. Moreover it allows defining an application logic. This programming ability is available for each device out of the box.

The **LogViewer** can show and convert the log files of the Baby-LIN-MB.

The **Baby-LIN-MB-Tool** allows to access many features of the Baby-LIN-MB. It can help to search and identify Baby-LIN-MBs, change the **network configuration** and select different modes. Scripts using the **ASCII command protocol** can be executed, debugged and logged. The simulation mode allows to **simulate** certain behaviours of the Baby-LIN-MB to test custom applications. Additionally the Baby-LIN-MB-Tool features many different **logging** capabilities.

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



Technical Specifications

Device

- CPU: ARM9, 180 MHz
- Memory: 64 MB SD-RAM
- 2 LEDs: Signal bus and error states
- 2 device specific push buttons
- Real-time clock
- Power supply: 18-32 VDC
- Power supply via 2 pin connector (MSTB 2,5/ 2-ST-5,08)
- Maximum current consumption: 250 mA @ 24 VDC
- Galvanic isolation of all communication interfaces (LIN-Bus, Ethernet, RS-232)

Interface: LIN

- 1 LIN-Bus interface available
- LIN-Bus connection via 9 pin Sub-D connector
- LIN-Bus supply voltage: 8-36 VDC
- LIN-Bus baud rate: up to 200 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: USB Host

- USB 2.0 interface via USB 2.0 type A connector
- Max current: 500 mA
- Supported file system: FAT-32, FAT-16

Interface: Ethernet

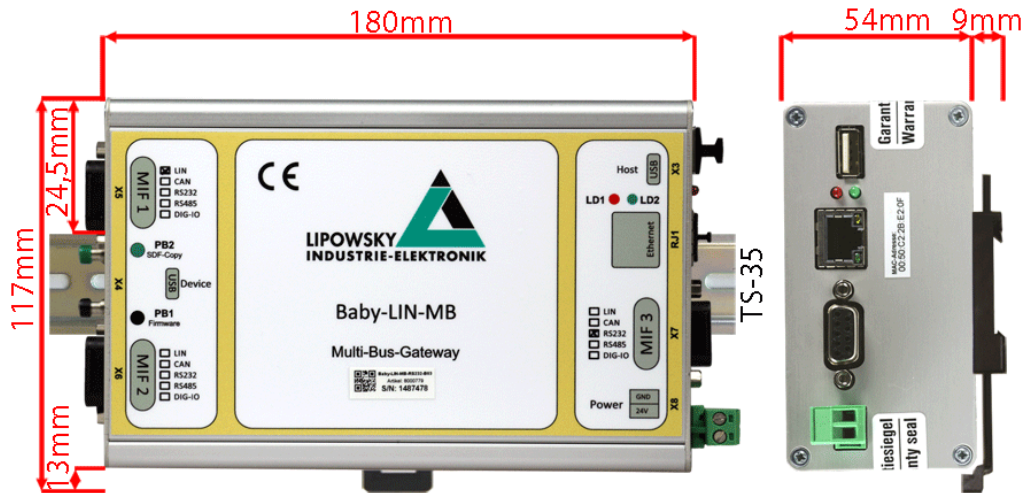
- Ethernet via RJ-45 connector
- Transfer rate: 10/100 MBit
- Auto MDI-X feature
- Command protocol: TCP-IP socket on port 10002

Interface: RS232

- Serial connection via Sub-D-9 female connector
- Data rate: 9600 Baud
- Data bits, parity bit, stop bit: 8-N-1

Case

- Degree of protection: IP20
- Operating temperature: -20° - +60° Celsius
- Weight: 580 g
- Case dimensions [mm]: 164 x 104 x 54 (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):



Advice

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

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

The user manual can be found in our LINWorks archive.

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 COM port | Required only, if the Baby-LIN-MB is controlled using the ASCII command protocol via the RS-232 interface. |
| Access to the local network | Required only, if the Baby-LIN-MB is controlled using the ASCII command protocol via the Ethernet interface. |
| A USB mass storage device | Required to transfer SDFiles and firmware updates to the Baby-LIN-MB. Can be used to log frames. |
| Power supply: 18-32 VDC | Voltage supply of the Baby-LIN-MB. |

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 incompatibility

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

Baby-LIN Workflow

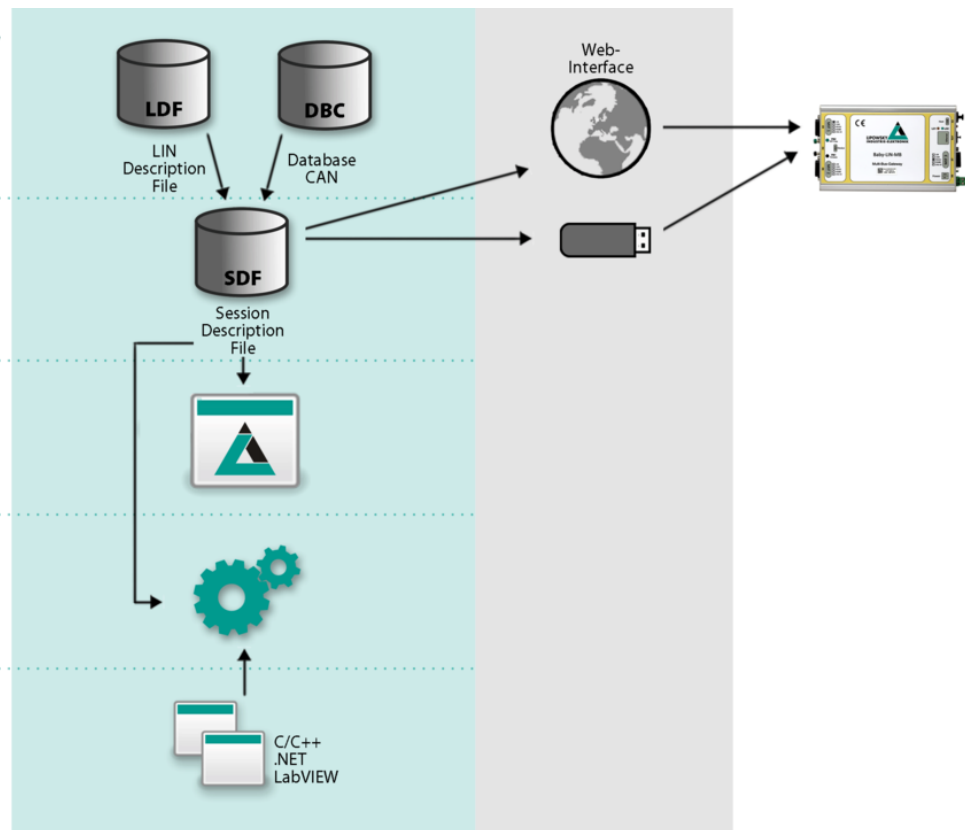
LDF-Editor

Session Configurator

Simple Menu

Baby-LIN-DLL

Custom Application



Scope of delivery

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

- Baby-LIN-MB device
- USB 2.0 cable, 1.5m, Type A to type B-Mini
- Plug components for all terminals:
 - 1 2-pin plug with screw connection (MSTB 2,5/ 2-ST-5,08)
- Download license for the LINWorks Suite (includes LINWorks PC software, example files and documentations)

Ordering information



Attention

This device is replaced by a successor and can not be ordered anymore. Please refer to the datasheet of the Baby-LIN-MB-II for updated ordering information.

| Main device | | |
|-------------|-------------|---|
| Item number | Item | Description |
| 8000779 | Baby-LIN-MB | Multibus simulation device with multi interface options |



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: Germany
 Customs tariff number: 90308930

Optional hardware components

| Item number | Item | Description |
|-------------|---------------------|---|
| 3020795 | MSTB 2,5/ 2-ST-5,08 | 2-pin plug component, screw connection with tension sleeve. Cable outlet parallel to plugin direction. Screw direction vertical 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 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-MB as test device. Try it for one week and convince yourself. Please contact us over info@lipowsky.de.

Distributors

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