LIPOWSKY
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Baby-LIN-3

Migration-Guide V1.2

Lipowsky Industrie-Elektronik GmbH

Römerstraße 57 | 64291 Darmstadt | Germany

Phone: +49 (0) 6151 / 93591 - 0 | Fax: +49 (0) 6151 / 93591 - 28

Website: *www.lipowsky.com* | E-Mail: *info@lipowsky.de*

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1 Introduction Baby-LIN-3

This migration guide will show you how to switch from a current 2.Generation Baby-LIN devices to a new 3.Generation device, depending on your current devices and it's used features.

Information
This guide assumes you are already using a Baby-LIN product. If you are a new user please read the getting started and product guide.

Attention
This guide is only for the discontinued devices of the Baby-LIN Family. The Baby-LIN-RM-III is not affected nor discussed here.

For this purpose check:
- What device you are currently using, wanted to buy again or replace.
- Which features you are using or need.

Attention
This guide is only describing the hardware difference between the generations and devices. The software framework is still the same though so you can use all your SDF files without changes. Nevertheless to properly recognize your device you have to update the **LINWork** to the latest version.

Tip
For more details about all features and the performance difference please check the User Manual of each device. For new quick overview check chapter New features and overview

2 New features and overview

With the new Baby-LIN-3 family comes a bunch of new features, the most important:

1) **1,54" TFT display** on the Baby-LIN-3-RC and Baby-LIN-3-RCplus.

2) Already activated **CAN-HS interface** with the upgrade option to CAN-FD on both the Baby-LIN-3-Dual and Baby-LIN-3-RCplus.

3) Activatable **second LIN bus** on the Baby-LIN-3-RCplus.

4) Two PWM capable combined **input/output pins** on the Baby-LIN-3-RCplus.

5) 480 MBit/s **high-speed USB** interface on all devices.

For an easier choice which device of the Baby-LIN-3 family may be suitable for you please check this matrix which list all devices and there features.

Device	1.LIN	2.LIN	CAN	IOs	Display and Keyboard	RTC	microSD-Card	RS232
Baby-LIN-3-Single	X							
Baby-LIN-3-Dual	X		X					
Baby-LIN-3-RC	X				X			
Baby-LIN-3-RCplus	X	X	X	X	X	X	X	X

3 Migration

3.1 Software

With the switch to a high-speed USB interface the Baby-LIN-3 family is now using the native Windows CDC driver instead of the one supplied with our framework. This means under Windows version 10 or higher you don't have to install the driver anymore.

If you use an older Windows version please read our guide **Baby-LIN-3 USB-driver for Win7/8**, on how to install a suitable driver or contact us for help: Support information

3.2 General Differences

Our company police is to keep differences between device iterations as small as possible to facilitate the upgrade to a new device. Nevertheless some differences are unavoidable with a new Generation and regardless of which device you have or will use you have to keep an eye on the following points.

3.2.1 USB

All Baby-LIN-3 have an USB-C instead of an USB-B mini plug so the cable has to be replaced with the one included. You can also use other USB-C cables but have to test them on your own if they are sufficient.

3.2.2 Connectors

All Baby-LIN-3 devices offer the same 3 pin plug for LIN and supply as before. Furthermore all devices have a SUB-D9 connector which contains all signals plus the signals of the 3 pin plug, so users can choose how to connect their device.

Tip
You find the pin-out for each device in the Datasheet or Manual.

3.2.3 Dimensions

Due to the introduction of new features we switched to a bigger enclosure for the third Generation. Overall a Baby-LIN-3 is still a small hand-held devices but may not fit in every space the previous generation did.

	3. Generation	2. Generation
Width in mm	66	45
Length in mm	92	78
Height in mm	28	18

3.2.4 LEDs

To make the devices more universal and the LED interface more easy to understand the blinking pattern of the green LED was changed.

LIN-Bus Voltage	3. Generation	2. Generation
Not Valid	50ms flashing	50ms flashing
Valid	Constant green light	500ms blinking

Furthermore there is now a single red/green LED (LED1) showing the LIN-Bus state instead of two separate red and green LEDs (LD1 and LD2). The bootloader state is shown with an orange blinking pattern of both LEDs on all devices, see the Datasheet for more information.

3.3 Baby-LIN-II to Baby-LIN-3-Single

The Baby-LIN-II features one LIN-Bus and can directly be replaced with the Baby-LIN-3-Single or all other devices, if you wish to extend the function range.

3.4 Baby-LIN-RC-II

The Baby-LIN-RC-II offers the following features: One LIN-Bus, a keyboard with six buttons, one high-side switch, a real-time clock and a slot for a microSD-Card. For the Baby-LIN-RC-II you have two choices depending on which features you are currently using.

3.4.1 To Baby-LIN-3-RC

If you only use the LIN bus or the keyboard of your Baby-LIN-RC-II you can switch to the Baby-LIN-3-RC or update to a Baby-LIN-3-RCplus.

3.4.2 To Baby-LIN-3-RCplus

If you either use the the SD-Card slot for logging, thee real-time clock (RTC) or a digital output or you want these features you have to take the Baby-LIN-3-RCplus.

3.4.3 Change of output connection

Like mentioned before in the chapter Connectors the Baby-LIN-3 family has the three pin plug for the LIN-bus and power supply. The Baby-LIN-RC-II-B and -C had a four pin plug though to integrate the additional digital output. Because of the SUB-D9 connector, which already has all signals on it, and to have a similar appearance the four pin plug was discarded.

Wherefore when changing to a new Baby-LIN-3 you have to swap your cables from the four pin plug to the SUB-D9 connector. In the table below the connections are matched so you don't need to change your SDF file.

Pin on Baby-LIN-RC-II	Signal on Baby-LIN-RC-II	Pin on SUB-D9	Signal on Baby-LIN-3-RCplus
X2-1	GND	6	GND
X2-2	LIN	4	1.LIN
X2-3	VCC	9	VCC
X2-4	VLIN-OUT	1	digital IO1

3.4.4 Change in LED usage

The Baby-LIN-RC-II had a dedicated red/green system LED (LD3 and LD4) which illuminated the microSD card slot and showed the state of the logging. For the Baby-LIN-3 the logging state is now shown in the display.

3.5 HARP-5 to Baby-LIN-3-RCplus

The HARP-5 don't have a direct replacement but most of it's functions can be substituted with the Baby-LIN-3-RCplus.

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3.5.1 Functions without replacement

Some of the functions of the HARP-5 are unique to it and didn't have a substitution:

Function	Description
Battery operation and 12V output	Ability to be be powered without external voltage and to source power to small nodes.
CAN low-speed interface	A second CAN channel with the low-speed physical layer.
Default connection of both LIN buses	1.LIN and 2.LIN were internally connected on default for gateway functionality.
Acoustic feedback	Internal beeper to give feedback to the user.

3.5.2 Functions with similar replacement

Although the Baby-LIN-3-RCplus has a rich set of features some differences to the HARP-5 have to be addressed:

Function	Baby-LIN-3-RCplus	HARP-5
Keyboard buttons	9	12
Display	240x240	128x64
External memory	microSD-Card	SD-Card
Minimal continuous current of outputs	230mA	900mA
CAN interface	CAN-HS or CAN-FD	CAN-HS
Galvanic isolation of interfaces	Yes	No

3.5.3 Change of connection

The pin-out of the SUB-D9 connector is kept as similar as possible, but some minor differences exist:

Pin	Baby-LIN-3-RCplus	HARP-5
1	digital IO1	Vswitch
2	CAN-L	CAN-HS-L
3	CAN-GND	GND
4	1.LIN	LIN-2
5	digital IO2	Supply-Config
6	GND	GND
7	CAN-H	CAN-HS-H
8	2.LIN	LIN-1
9	VCC	VBAT

CAN ground

Due to the galvanic isolation of the CAN-Bus in the Baby-LIN-3 family pin 3 and pin 6 of the SUB-D9 are not connected anymore.

When you used pin 3 as power supply return this cable has now to be connected to pin 6 and pin 3 has to be connected to ground of your CAN-Bus.

If you have no separate ground for the CAN-Bus pin 3 and pin 6 have to be bridged.

HARP-5 DIO

The digital IO pin (DIO) of the HARP-5 was routed to the six pin plug together with the 1.LIN and the CAN-LS interface. The DIO pin has to be reconnected to pin 5 (digital IO2) of the Baby-LIN-3-RCplus SUB-D9 connector. The Supply-Config pin of the HARP-5 was used to enable or disable the

supply through the LIN-Bus power and is not need anymore.

3.5.4 Functions with direct replacement

- Two LIN channels (Swap of SDF sections or cables necessary)
- One CAN-HS channel
- Real-time clock with backup battery
- Two digital outputs

3.6 Baby-LIN-MB-II to Baby-LIN-3-MB

The new Baby-LIN-3-MB will be released in February 2025. We will publish a separate migration guide for this product.

4 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.

Author	Lipowsky Industrie-Elektronik GmbH Römerstraße 57 64291 Darmstadt
Phone	+49 (0) 6151 / 93591 - 0
E-Mail	*info@lipowsky.de*
Website	*www.lipowsky.com*
CEO	Andreas Lipowsky
Commercial register	Darmstadt HRB 5139
VAT-ID	DE 111647423
Quality Management	DIN EN ISO 9001:2015