



Develop DALI-compatible devices  
according to DALI 2 standard  
in a very short time

Supports device developers

## DALI stack

The MBS DALI stack helps device developers develop DALI-compatible operating devices such as push buttons or lights and control devices such as light sensors or motion sensors with one or more DALI control units in a very short time. It simplifies the development process for DALI 2.0 while significantly reducing development times and costs.

The DALI stack provides the core functions and software components needed for the development of control and operating devices compatible with DALI 2.0.

For more information: [www.mbs-solutions.de](http://www.mbs-solutions.de)



## DALI stack

Develop DALI-compatible devices according to DALI 2 standard in a very short time

The update to IEC 62386 means that many devices that still work with DALI-1 now need to be modernised. Lamp and lighting manufacturers seeking to quickly and easily equip their operating or control devices with DALI version 2 can use the stack from MBS. It simplifies the development process for the bus system while saving significant time and costs.

Whether for light applications for rooms or buildings of all sizes, complex lighting for stage shows or expensive underwater illuminations – the DALI bus protocol (Digital Addressable Lighting Interface) has established itself as the standard for electronic light management in industrial and commercial settings. This is because only a small number of lines is required to energise a huge number of lights and therefore make use of numerous functions. At the same time, the protocol is easy to integrate into the higher-order building automation systems.

For over 20 years, DALI-1 has stood alongside IEC 62386 as the standard for lighting control in properties. This standard was updated in 2014 to resolve inaccuracies and improve interoperability. As a result, many products need to be modernised as the updated standard now applies to tenders in the commercial context. As such, lamp and lighting manufacturers seeking to equip their products with DALI VERSION 2 now need to ask themselves: build or buy?

### Focus on the essentials

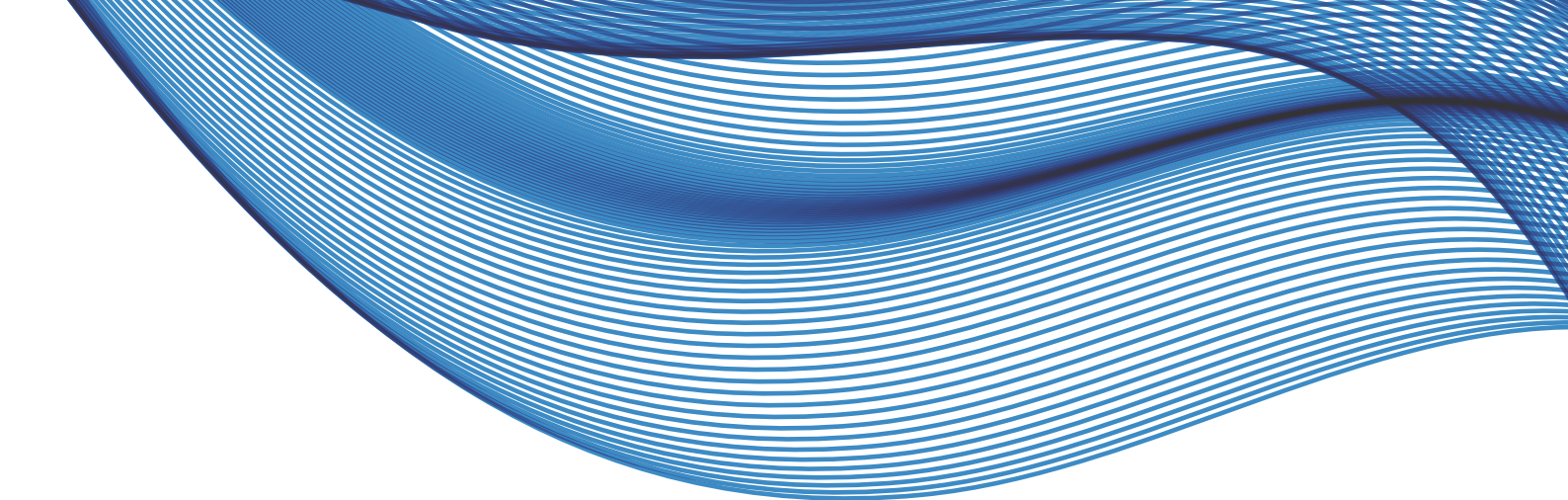
Any company that opts not to have its own development department can seek support from the DALI stack of MBS GmbH. It was designed in close cooperation with leading semiconductor manufacturers, such as Renesas, ST and Microchip, as every light energised by this bus protocol requires its own microprocessor. The stack contains the core functions and software components required to program standard-compliant devices.

The application program communicates with other operating (e.g. buttons, lights) and control (e.g. light sensors, motion sensors) devices using the API function. For the user, this does not require any knowledge about the bus protocol, therefore allowing them to focus exclusively on the actual application. As such, the software stack enables users to rapidly develop DALI-compatible operating or control devices with one or more control units. This not only simplifies the development process, but also greatly cuts costs.

### One-Stop-Shop

This means that lamp and lighting manufacturers can avoid the need to run their own development departments, as well as the time and costs that go into this, yet still equip their products with DALI version 2. To help the industry reach its goals sooner, MBS also offers a whole range of services related to the multifaceted protocol. This includes, for instance, the option to also commission smaller tasks, such as for customer-specific expansions or integration of stacks into manufacturer solutions. As well as agreeing maintenance contracts, MBS customers can also secure the support of the Krefeld-based building automation specialist. Highly qualified developers provide support from the first hardware concept through to the review stage, from the definition of the hardware interfaces to the certified product. Even those unfamiliar with the standard can seek guidance from MBS on the road to successful products or take advantage of the support





for certification tests offered by the DALI alliance DiiA (Digital Illumination Interface Alliance). Several products from various manufacturers have received this certification with the stack from MBS and achieved market success.

### **Continuous expansion**

Two highly qualified IT experts are permanently working to ensure that the software stack is not only state of the art, but also continues to make work easier and easier. This means that specific standardised functions are integrated into the standard immediately and free of charge. A modular approach was chosen to allow certain features to be selected. This reduces the required storage space in the individual microprocessor, therefore making it less expensive. This is not insignificant, as every device energised with DALI requires its own microprocessor, which accounts for the high quantities here. Furthermore, the MBS experts ensure continuous expansion: while only 32- and 16-bit processor types have been supported up to now, it will also be possible to program 8-bit processors with it in the future. In spite of these improvements, the stack continues to be made smaller and smaller.

MBS GmbH has long been on the market as a specialist in hardware and software for building automation, during which time it has built up stable, lasting relationships with its customers. With two full-time developers, the company has a clear advantage when it comes to knowledge of the DALI standard. The reliable support team responds promptly to technical queries. Competitive prices and pricing options adapted to customer needs leave plenty of room for individual ways of using the software stack.

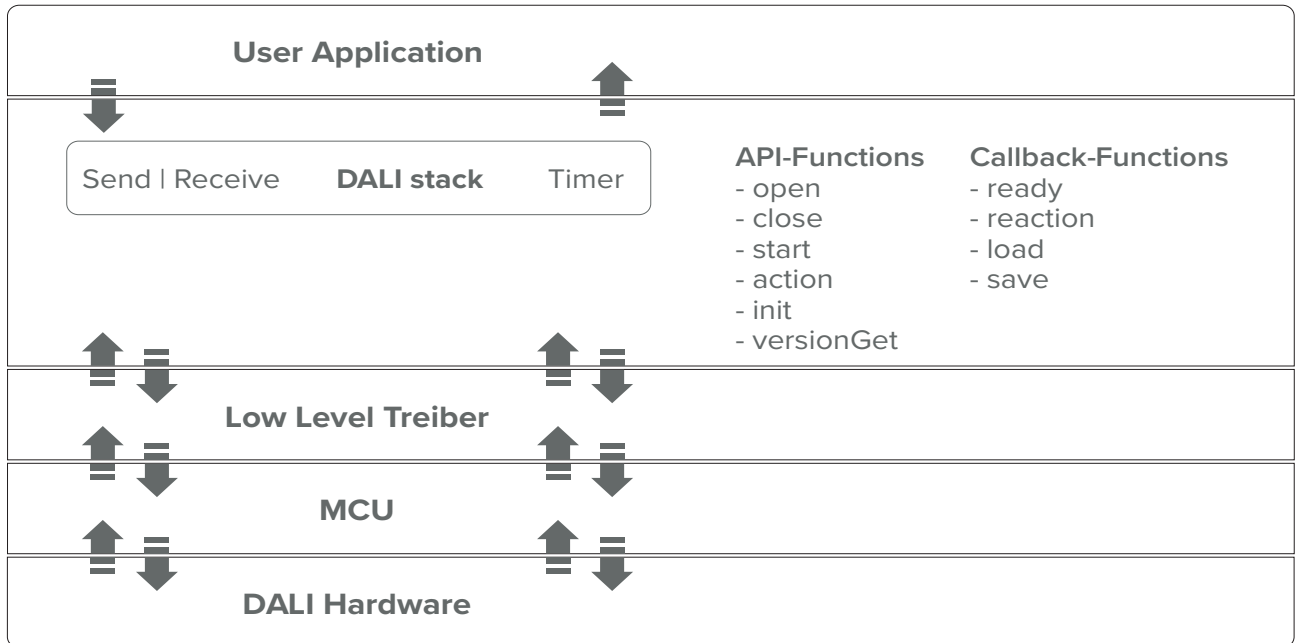
### **Perspective: the D4i standard**

The company also keeps an eye out for emerging trends regarding the operation of commercial properties. With regard to the DALI bus system, it is clear that the integration of products into the Internet of Things (IoT) is becoming ever more important for the lighting industry. This is because it makes it easier to achieve targets such as energy efficiency and wireless control of intelligent lights. MBS is accompanying the associated upgrade of the standard to D4i quality with its DALI stack in order to pave the way for lamp and lighting manufacturers to enter this market as well.

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## The architecture

To incorporate a DALI stack into an application, a header file named 'libdali.h' is available in which all necessary data types, functions, structures, constants as well as action and reaction codes are defined. The DALI stack is available as a binary file named 'liblibdali.a'.



## DALI stack implements DALI 2.0 functions

The DALI stack supports functionalities defined in the general specifications for DALI 2.0 operating and control devices. This includes the following functions:

- Processing of all DALI commands from the DALI bus, monitoring of all relevant fault statuses of the DALI bus.
- Prerequisite: Transmission errors at bit/frame level must be recognised and processed by the low level driver.
- Processing of corresponding light output for the transmission controller with timing and sequence fade conditions
- Handling of the DALI controller via the bus interface; DALI abbreviated address allocation, including assignment of random addresses by agreement with the DALI controllers. The DALI stack provides configuration commands; automatic configuration logic from DALI devices must be implemented in advance in the HOST application.

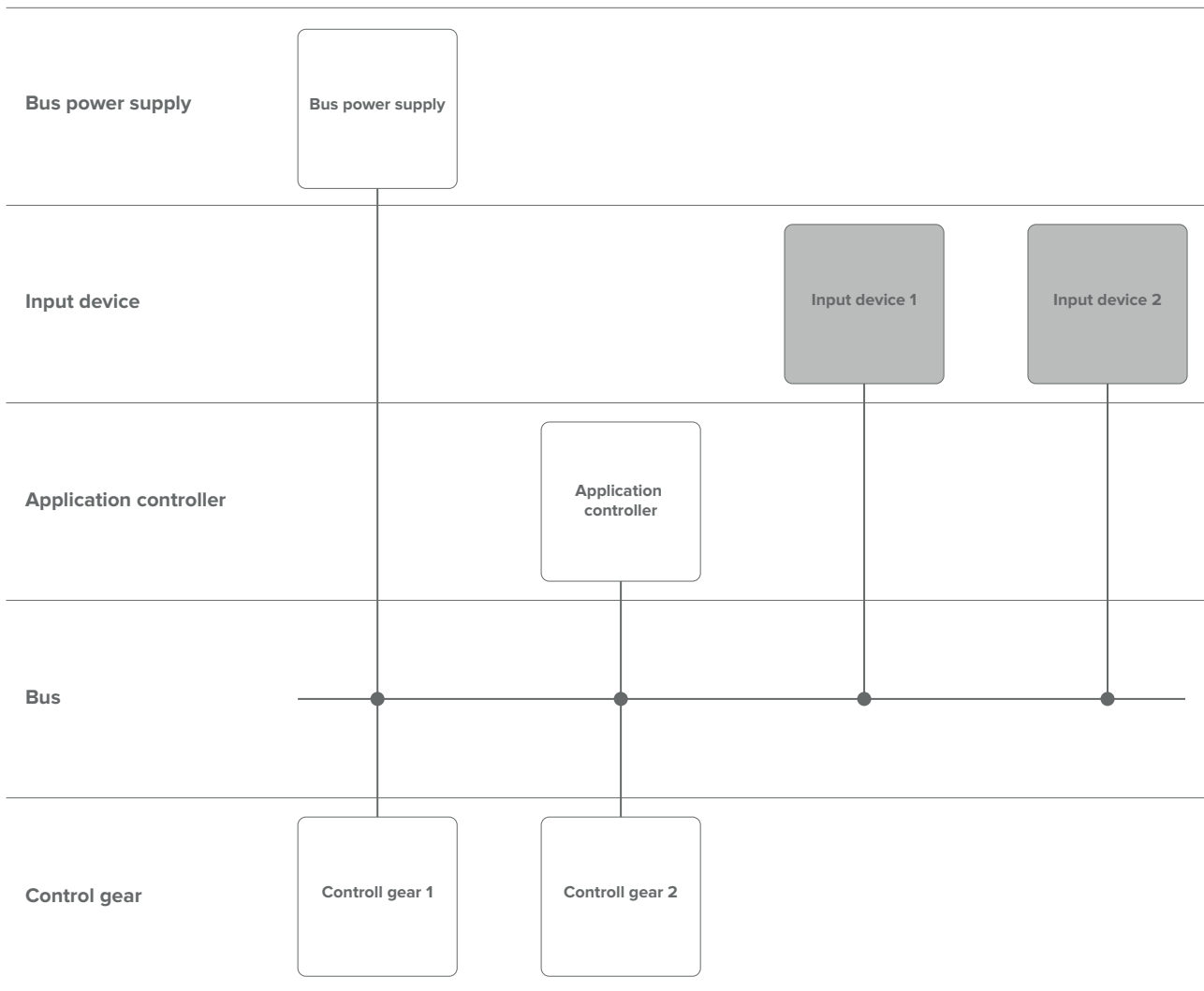
- Management of delays and other timing conditions in relation to DALI operations. Timings at bit/frame transmission level are managed by the low level driver, while timings above frame level (timing conditions between several DALI frames) are managed by the DALI stack.

## Power supply specifications

- DALI Part 250 – Integrated Bus Power Supply (Device Type 49)

## Data specifications for LED drivers

- DALI Part 251 – Memory Bank 1 Extension (Device Type 50)
- DALI Part 252 – Energy Reporting (Device Type 51)
- DALI Part 253 – Diagnostics & Maintenance (Device Type 52)



## Properties

- Simple communication
- Makes development easier
- Communicates via the Stack API function
- Developed with ANSI-C
- DALI 2.0 (IEC 62386)

## Device types

The DALI stack supports various device types and can be set up as appropriate

Mode I: Control device

Control devices

- Singlemaster technology according to IEC 62386 part 103
- Multimaster technology according to IEC 62386 part 103

Mode II: Input device

Input devices

The following input devices are supported:

- Part 301 (Push buttons)
- Part 303 (presence sensors)
- Part 304 (light sensors)

Mode III: Operating device

Control gears

- Part 201 (Fluorescent lamps) device type 0
- Part 206 (Conversion of digital signals to DC voltage DC voltage signal) device type 5
- Part 207 (LED Modules) device type 6
- Part 208 (Switching function) device type 5
- Part 209 (Color control) device type 8 RGBWAF Only

## Need help with integration?

As an option, MBS can set up the low level driver needed to send and receive DALI frames and configure the DALI stack and its components according to your specific control solution.

We will also help you realise application-specific DALI functions for operating devices, especially for hardware-independent functions such as triggering the HOST application, so that the stack can switch on a lamp with a brightness value of (x).

Contact us!

## Licence models

Library Leasing p.a.

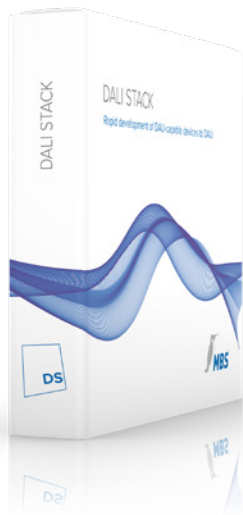
The programme library is available for use for a limited period of time.

Library Buyout

The programme library is available for use on a permanent basis.

Source Buyout

The source code is permanently available for use.



## You want to buy DALI stack?

No problem. We will be happy to take your order by email :

[BUY NOW](#)

or by telephone:  
+49 21 51 72 94-0

### Memory requirements overview

(The specifications may deviate slightly.)

#### All features active including D4i extensions:

#### All features active without D4i extensions (Delivery status):

#### Devices turned off (No more application controller possible only gears):

#### Devices turned off, no colour support (DT8):

32Bit CPUs		16 Bit CPUs	
Flash	Ram	Flash	Ram
88 kB	11 kB	34 kB	9 kB
81 kB	10,2 kB	30,2 kB	8 kB
62 kB	9,5 kB	22 kB	7,2 kB
55 kB	9 kB	19 kB	7 kB

### Hardware requirements:

- The library works with a stack size between 1 and 1.5 kByte
- Two GPIOs (One with Interrupt)
- A timer with a width of at least 24 bits and a corresponding timer interrupt
- The DALI2 library requires support for non-volatile memory of at least 526 bytes

Imprint: **Managing Director:** Martin Brust-Theiß, Gerhard Memmen-Krüger, Nils-Gunnar Fritz

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\*Technical data subject to change without notice.