

## DALI USB

### Datasheet DALI USB Interface

Communication interface  
between PC and modules on a DALI Bus

USB	Art. Nr. 24138923
USB-Mini	Art. Nr. 24138923DO
USB 30mA	Art. Nr. 24138923-30
USB 30mA	Art. Nr. 24138215-30
USB HS	Art. Nr. 24138923-HS
Flash USB HS	Art. Nr. 89454248
wDALI USB	Art. Nr. 24138923-wD

# DALI USB Interface

## Overview

- Communication interface between DALI systems and the configuration software tool: DALI Cockpit.
- bidirectional data communication for DALI bus monitoring, configuration and control.
- support of the Standard DALI protocol, DALI-2 protocol, and various extended DALI protocols
- USB and DALI-line are galvanically isolated.
- supply via DALI-line and USB interface
- various types available:
  - standard
  - mini
  - with integrated 30mA bus power supply
  - DALI-2 version with integrated 30mA bus power supply
  - for DIN rail mounting
  - for DIN rail mounting with flash memory
  - wireless
- 2 sets of DALI terminals for easy connection - signal line can be looped through

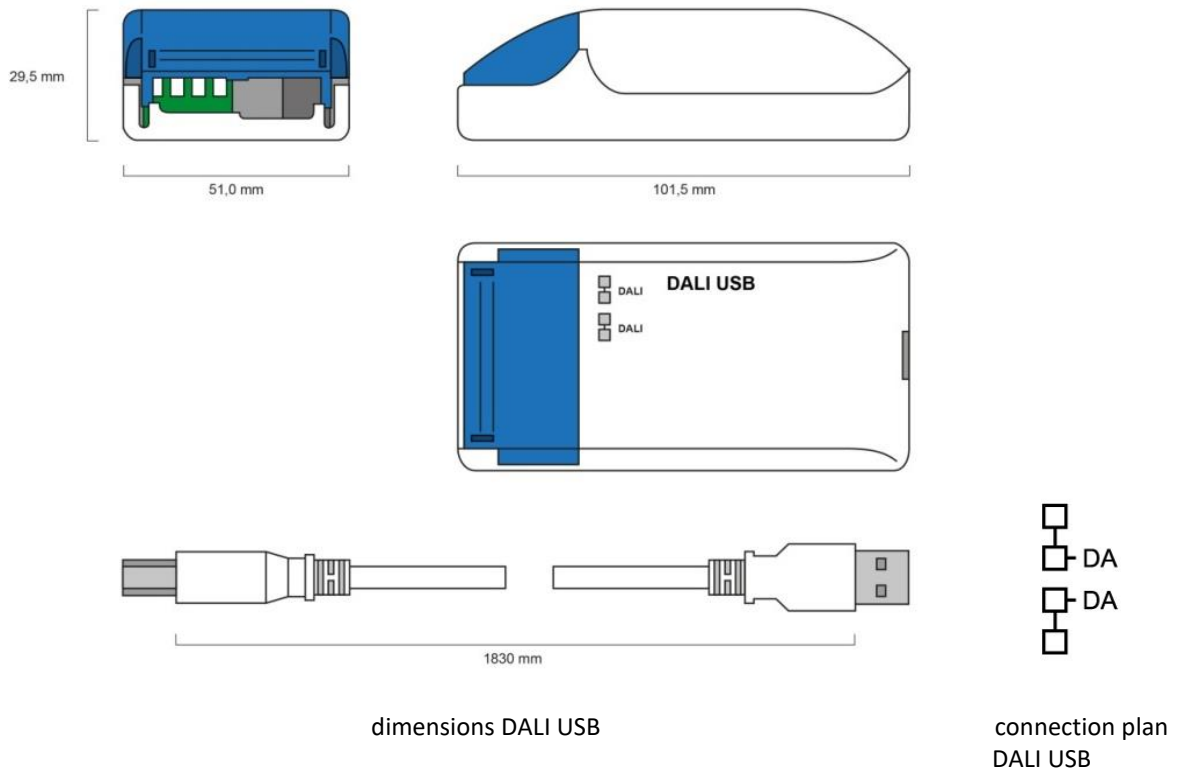


## Specification, Characteristics

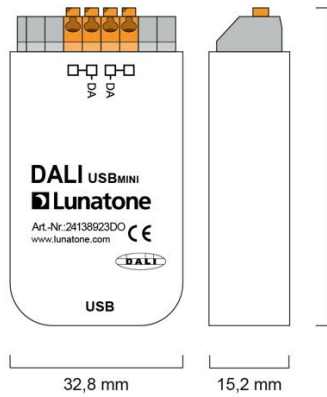
Type	DALI USB	DALI USB Mini	DALI USB 30mA	DALI-2 USB 30mA
article number	24138923	24138923DO	24138923-30	24138215-30
geometry LxWxH	102x51x30mm	59x33x15mm	59x33x15mm	59x33x15mm
housing, installation	Mouse	back box	back box	back box
typ. current consumption	DALI: 6mA, USB: 10mA	DALI: 6mA, USB: 10mA	USB: 40mA	USB: 40mA
bus power supply	-	-	30mA	30mA
USB connector on device	USB B	USB Mini	USB Mini	USB C
included USB Cable	USB A - USB B	USB A -USB Mini	USB A -USB Mini	USB C - USB C
RF radio connection	-	-	-	-
storage / transportation temperature	-20°C ... +75°C	-20°C ... +75°C	-20°C ... +75°C	-20°C ... +75°C
operational ambient temperature	-20°C ... +75°C	-20°C ... +75°C	-20°C ... +60°C	-20°C ... +60°C
protection degree, IP Code	IP20	IP20	IP20	IP20
Certification	DALI, CE	DALI, CE	DALI, CE	DALI-2, CE

Type	DALI USB HS	DALI Flash USB HS	wDALI USB
article number	24138923-HS	89454248	24138923-wD
geometry L x W x H	98x17.5x56mm	98x17.5x56mm	59x33x15mm
housing, installation	din rail	din rail	back box
typ. current consumption	DALI: 6mA, USB: 10mA	DALI: 6mA, USB: 10mA	DALI: 9mA, USB: 40mA
bus power supply	-	-	-
USB connector type	USB Mini	USB Mini	none, wireless (+ USB dongle)
included USB Cable	USB A — USB Mini	USB A — USB Mini	none
RF radio connection	-	-	2.4Ghz / up to 300m
storage and transportation temperature	-20°C ... +75°C	-20°C ... +75°C	-20°C ... +75°C
operational ambient temperature	-20°C ... +75°C	-20°C ... +75°C	-20°C ... +75°C
protection degree, IP Code	IP20	IP20	IP20
Certification	DALI, CE	DALI, CE, RCM, UKCA	DALI, CE

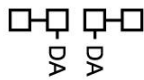
**DALI USB:**



**DALI USB Mini:**

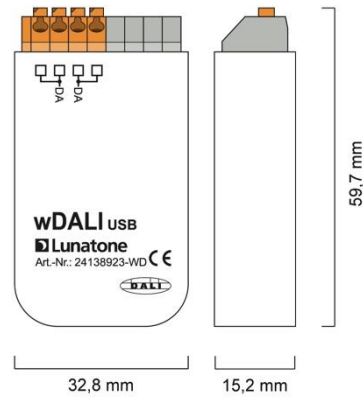


dimensions DALI USB Mini

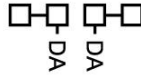


connection plan  
DALI USB Mini

**wDALI USB:**

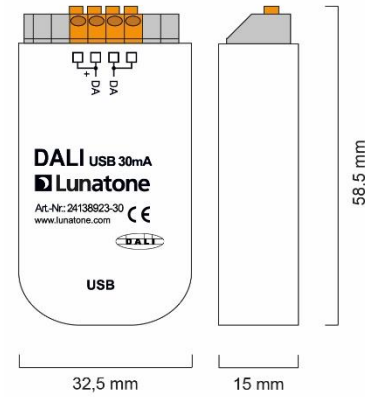


dimensions wDALI USB

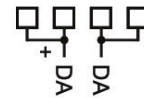


connection plan  
wDALI USB

**DALI USB 30mA:**

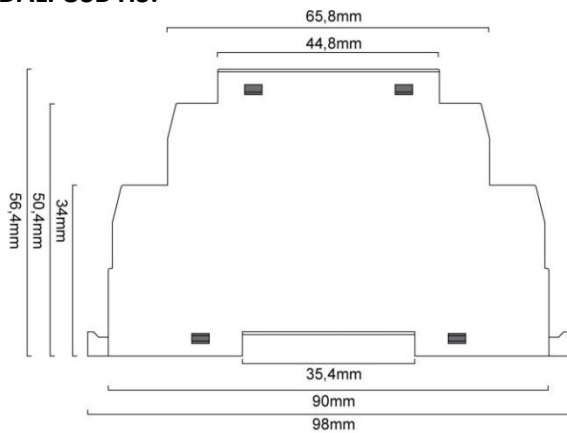


dimensions DALI USB 30mA



connection plan  
DALI USB 30mA

**DALI USB HS:**

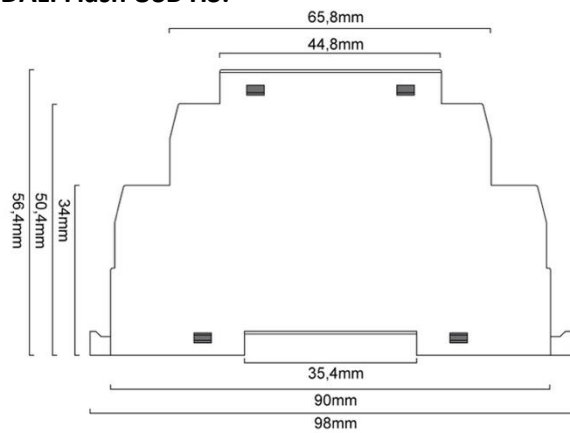


dimensions DALI USB HS



connection plan DALI USB HS

**DALI Flash USB HS:**



dimensions DALI Flash USB HS



connection plan DALI Flash USB HS

## Connection and Electrical Specification

The DALI USB module is supplied by the DALI-line (current consumption ~6mA) as well as by USB (current consumption 10mA/40mA max). The DALI-line and the USB are galvanically isolated. The connection to the DALI-line is polarity free and protected against overvoltage of up to 270Vac.

## Installation

- For the DALI-2 USB without included bus power supply an external DALI bus power supply is required.
- The wiring should be carried out as a permanent installation in a dry and clean environment.
- Installation may only be carried out in a voltage-free state of the system and by qualified specialists.
- National regulations for setting up electrical systems must be followed.
- **DALI-2 USB 30mA:** the polarity of the output voltage is marked on the housing (DA+, DA-).
- **DALI-2 USB:** the connection to the DALI terminals can be made regardless of the polarity.
- The DALI line may be routed together with the mains voltage (in one cable or as single wires in a tube).
- The DALI-line must not be connected to the mains or extra low voltage (SELV) systems.
- Only 1 wire may be connected to each terminal. When using double wire end ferrules, the connection capacity of the terminal must be considered.

- The DALI wiring can be realised with standard low-voltage installation material. No special cables are required.
- Wiring topology of the DALI-line: line, tree, star.



**Attention:** The DALI-signal is not classified as SELV circuit (Safety Extra Low Voltage). Therefore, the installation regulations for low voltage apply.



The voltage drop on the DALI line must not exceed 2V at maximum length (300m) and maximum bus load (250mA).

## Available device types

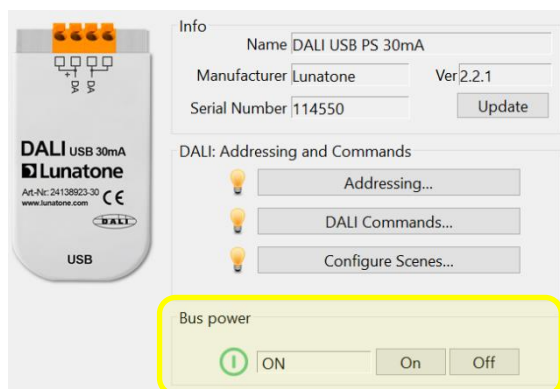
Variants with additional functionalities and different types of housings are available (see drawings and specification).

### DALI USB 30mA and DALI-2 USB 30mA

Offers an integrated DALI bus power supply of 30mA, the power is supplied via USB. This power supply is switched off by default and can be activated in the DALI Cockpit configuration software. (A version with the bus power supply on by default is available on request.)



Please note that the **maximum bus supply must not exceed 250mA**. If the external bus supply already delivers 250mA, the 30mA of the DALI USB should not be activated.



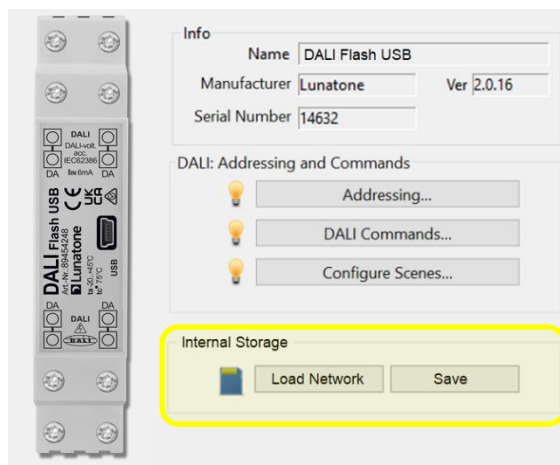
### wDALI USB

Instead of a USB cable, a USB dongle (USB type A) is connected to the PC and the Receiver is connected to the DALI bus. The transmission range depends on the local conditions.



### DALI Flash USB HS

The DIN Rail version is intended for permanent installations where a fixed interface is required. With the Flash function the «project file» from the DALI Cockpit Software can be saved directly to the flash memory of the DALI USB interface. It will be loaded when reconnected to a PC. Therefore, a copy of the complete configuration is always available on site.



## Application – DALI Cockpit

The Lunatone DALI Cockpit Software package is a configuration and monitoring tool for DALI systems. With any Version of the DALI USB or DALI-2 USB and the DALI Cockpit, the connected DALI bus can be addressed and the connected devices can be configured. Bus traffic can be monitored using the included tool DALI Monitor.

The manual of the DALI Cockpit can be found here: [https://www.lunatone.com/wp-content/uploads/2018/03/DALI-Cockpit\\_StartUp\\_Guide\\_Manual\\_EN\\_M0010.pdf](https://www.lunatone.com/wp-content/uploads/2018/03/DALI-Cockpit_StartUp_Guide_Manual_EN_M0010.pdf)

On request, a Windows developer kit for software development describing the communication with the DALI Bus Server interface is available (Please note: maintenance of the developer kit has been discontinued). For software development including communication with the DALI bus the usage of the DALI-2 USB and the LUBA protocol is advised see section: DALI-2 USB Interface and LUBA Protocol.

## DALI USB, Firmware Update and Windows-Installation

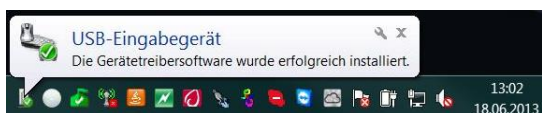
art.nr. 24138923-\_  
art.nr.: 89454248

The DALI USB-interfaces (art.nr. 24138923-\_  
and art.nr.: 89454248) have the following properties. For properties of the DALI-2 USB interfaces (art.nr.: 24138215-\_) see the following section: DALI-2 USB Interface and LUBA Protocol.

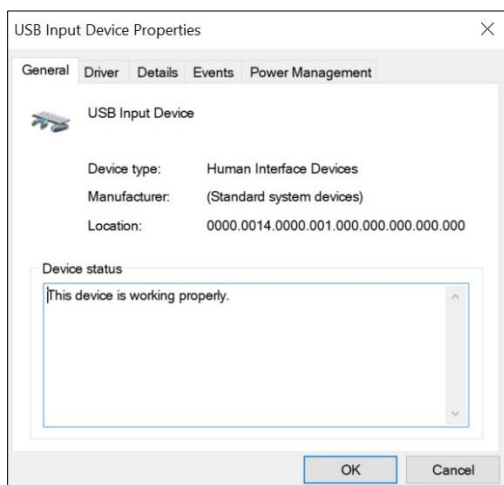
vendor ID	17B5h (Lunatone Industrielle Elektronik GmbH)
product ID	0020h
USB current consumption	10mA max.
speed	full speed USB device (12MBit/s max.)

Any DALI USB firmware update will be carried out automatically via USB by the program “DALIBusServer.exe”. This program is part of the DALI Cockpit Software package and will be installed automatically with the DALI Cockpit.

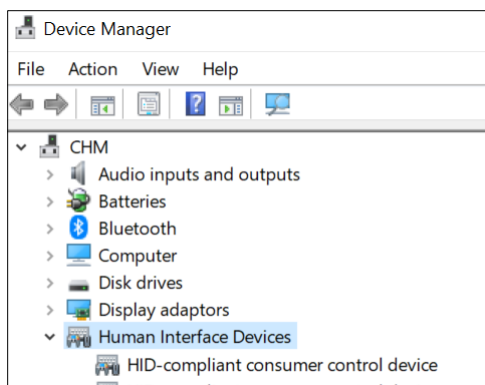
The DALI USB is implemented as USB HID (Human Interface Device).



A driver installation is not required due to the windows-integrated support for human interface devices. The DALI USB will be detected by the operating system and all required drivers will be installed automatically.



After the installation process is successfully completed the device can be found in the Device Manager: section HID (Human Interface Devices).



### Supported DALI Specifications and Operating Modes

The DALI USB module supports the following protocols:

- standard DALI (16bit)
- standard DALI (8bit), backchannel
- eDALI, special 25bit Tridonic protocol (24bit data)
- DALI2 (24Bit) forward frame according IEC 62386-103 and NEMA DALI, 24bit corresponding to NEMA standard publication 243-2005
- 17bit DALI, special DALI-frame used by Helvar
- DSI on DALI bus (16bit and 8bit), signal on DALI-line is set LOW 10ms before and after sending a DSI-frame

The DALI USB interface supports the transmission of DALI commands as well as monitoring functions for the DALI communication. During monitoring each DALI command on the DALI line, that corresponds to the supported protocols, is transmitted to the PC.

### DALI-2 USB Interface and LUBA Protocol

art.nr. 24138215-\_\_

The DALI-2 USB is recognized as hardware interface / serial port interface. Windows 10 and higher includes automatic drivers for recognizing the device. Drivers for windows 7 and lower are available on request.

After installation the device can be found in the Windows Device Manager section “Ports (COM)”



For the DALI-2 USB interface the following settings should be configured for transmission (38400,8,n,1).

transfer rate	38400 Baud
number of data bits	8
parity bit	no
stop bit	1

The DALI-2 USB supports the transmission of Standard DALI commands as well as several proprietary protocol extensions.

An easy transmission protocol is implemented for communication with the DALI-2 USB and DALI-2 RS232 interface, called LUBA Protocol (Lunatone universal Building and Automation Protocol).

### Supported DALI Specifications and Operating Modes

- standard DALI (16Bit)
- standard DALI (8Bit), backchannel
- standard DALI (24Bit, DALI-2) for control devices and event messages
- eDALI, special 25bit protocol (24bit data) - Tridonic
- different bit numbers: e.g. 17Bit (special DALI frame by Helvar)

The DALI-2 USB offers sending and receiving of commands as well as the ability to monitor and observe the DALI-line communication. In monitoring mode each message will be transmitted to a PC if it corresponds to one of the supported protocols.

## LUBA Protocol

### Supported Commands:

#### General DALI commands

- **Read/Write DALI Settings** – read and write of DALI settings
- **Read DALI Status** – read the DALI interface status
- **add DALI Frame to TX Buffer** – add DALI commands to the send buffer
- **add 16bit DALI Frame to TX Buffer** – add 16-bit DALI commands to the send buffer
- **add 24bit DALI Frame to TX Buffer** – add 24-bit DALI commands to the send buffer
- **add eDALI Frame to TX Buffer** – add eDALI commands to the send buffer

#### Commands for DALI addressing

- **Read Device List** – read the device list stored in the device
- **Device Search** – search for addressed devices
- **Addressing** – start DALI addressing (new installation or system extension)
- **Find Duplicates** – find devices with the same address
- **Delete Device** – delete the DALI address of a specific device

#### Special Commands

- **Read Device Types** – read DALI device types
- **Read/Write Memory Bank** – read or write memory bank entries
- **Fade to Level / Color** – Fade to a certain light level and / or colour value
- **Read / Store Scene** – read or write scene values

#### System commands

- **Query Device Info** – read out device information
- **Read/Write Device Name** – read or write name of the interface



- **Query Device Descriptor** – read device descriptor
- **Read / Write User Definable Memory** – read or write user definable memory
- **Makro Status** – Status Display of the commands created as macros and, if necessary, stop running macros. Read status of commands

A detailed description of the commands, their command numbers and structure can be found in the LUBA protocol description: [https://www.lunatone.com/wp-content/uploads/2021/04/LUBA\\_Protocol\\_EN.pdf](https://www.lunatone.com/wp-content/uploads/2021/04/LUBA_Protocol_EN.pdf)

The data transfer can be processed by any program that supports the respective protocol.

Python Example code for a simple project can be downloaded here: [www.lunatone.at/projects/LUBA/lubadevkit.zip](http://www.lunatone.at/projects/LUBA/lubadevkit.zip)

## Purchase Information

**Art.Nr. 24138923:** DALI USB, Mouse

**Art.Nr. 24138923-DO:** DALI USB Mini

**Art.Nr. 24138923-30:** DALI USB 30mA

**Art. Nr. 24138215-30:** DALI-2 USB 30mA

**Art.Nr. 24138923-HS:** DALI USB HS

**Art.Nr. 89454248:** DALI Flash USB HS

**Art.Nr. 24138923-wD:** wDALI USB

## Additional Information and Equipment

DALI-Cockpit – free configuration tool for DALI systems

[www.lunatone.com/en/product/dali-cockpit/](http://www.lunatone.com/en/product/dali-cockpit/)

Lunatone DALI products

<https://www.lunatone.com/en/>

Lunatone datasheets and manuals

<https://www.lunatone.com/en/downloads-az/>

## Contact

Technical Support: [support@lunatone.com](mailto:support@lunatone.com)

Requests: [sales@lunatone.com](mailto:sales@lunatone.com)

[www.lunatone.com](http://www.lunatone.com)



## Disclaimer

Subject to change. Information provided without guarantee. The datasheet refers to the current delivery.

The compatibility with other devices must be tested in advance to the installation.