Lunatone

DALI RS232 PS
DALI-2 RS232 PS

Datasheet
DALI-2 RS232 Interface

Communication interface
between a PC (or PLC) and modules
in a DALI lighting system
with integrated power supply

New: Lunatone Universal Building
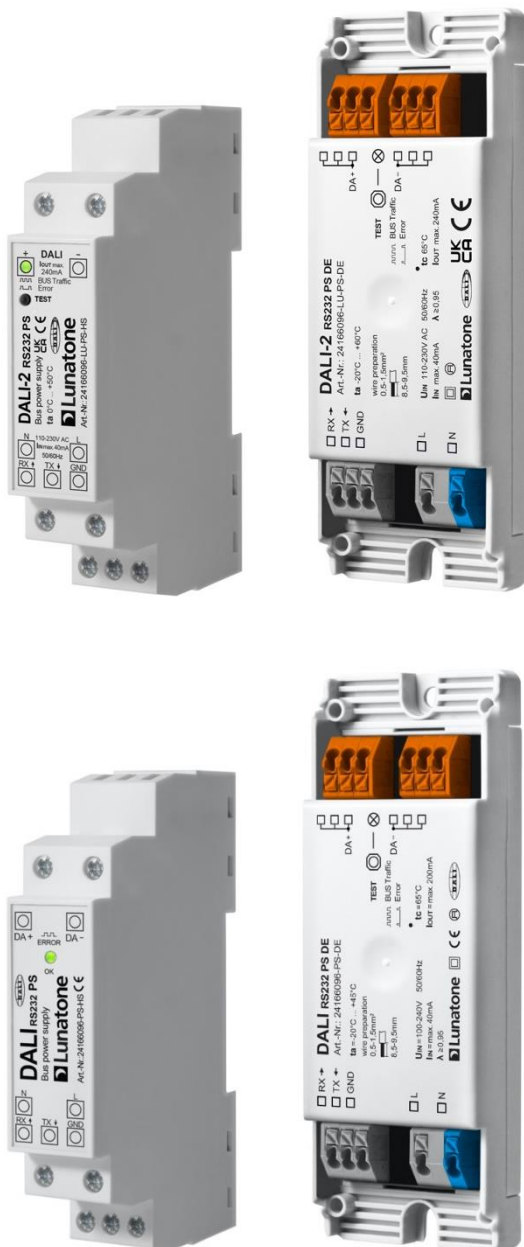and Automation Protocol
DALI-2
Art. Nr. 24166096-LU-PS-DE
Art. Nr. 24166096-LU-PS-HS

previous Protocol
DALI
Art. Nr. 24166096-PS-DE
Art. Nr. 24166096-PS-HS

DALI-2 RS232 PS Interface

Overview

- Module with a serial interface to communicate with components in a DALI-line via RS232
- Easy connection of a PC or a PLC to a DALI system
- Bidirectional data traffic
- Addressing, configuration, status queries and monitoring
- Support for various proprietary DALI protocol extensions
- Galvanic isolation
- Supply via mains voltage
- Integrated bus supply

- Double DALI terminals for remote ceiling version (Art.Nr: 24166096-PS-**DE** and 24166096-LU-PS-**DE**)
- DALI-2 version with NEW protocol: **LUBA** (**L**unatone **U**niversal **B**uilding and Automation Protocol) Art.Nr.: 24166096-**LU**-PS-DE and Art.Nr.: 24166096-**LU**-PS-HS

Specification, Characteristics

Type	DALI-2 RS232 PS DE	DALI-2 RS232 PS HS
article number	24166096-PS-DE 24166096-LU-PS-DE	24166096-PS-HS 24166096-LU-PS-HS

Electrical Data:

input type	supply, mains- voltage	
marking terminals	L, N	
input voltage range	110Vac … 230Vac	110Vac … 230Vac
max. input supply current	40mA (@110Vac), 20mA (@240Vac)	
input supply frequency	50Hz / 60Hz	
max. power consumption	5,3W	
start-up time	250ms	
max. power supply DALI	240mA	
RS232	38400Baud, 8databits, no parity, 1 stop bit (38400,8,n,1)	

Technical Data:

|		
storing and transportation temperature	-20°C … +75°C	-20°C … +75°C
operational ambient temperature	-20°C … +60°C	0°C - 50°C
protection code	IP20	
wire size RS232 terminal	1.5mm^2	2.5mm^2
wire size DALI terminal	1.5mm^2	2.5mm^2
connection type	spring terminal connector	screw connector
dimensions (l x w x h)	120mm x 40mm x 22mm	90mm x 57mm x 18mm
mounting	remote ceiling housing	DIN Rail

Lunatone

DALI-2 RS232 PS DE --- Art.Nr.: 24166096-**LU**-PS-DE

dimensions

connections

DALI RS232 PS DE --- Art. Nr.:24166096-PS-DE
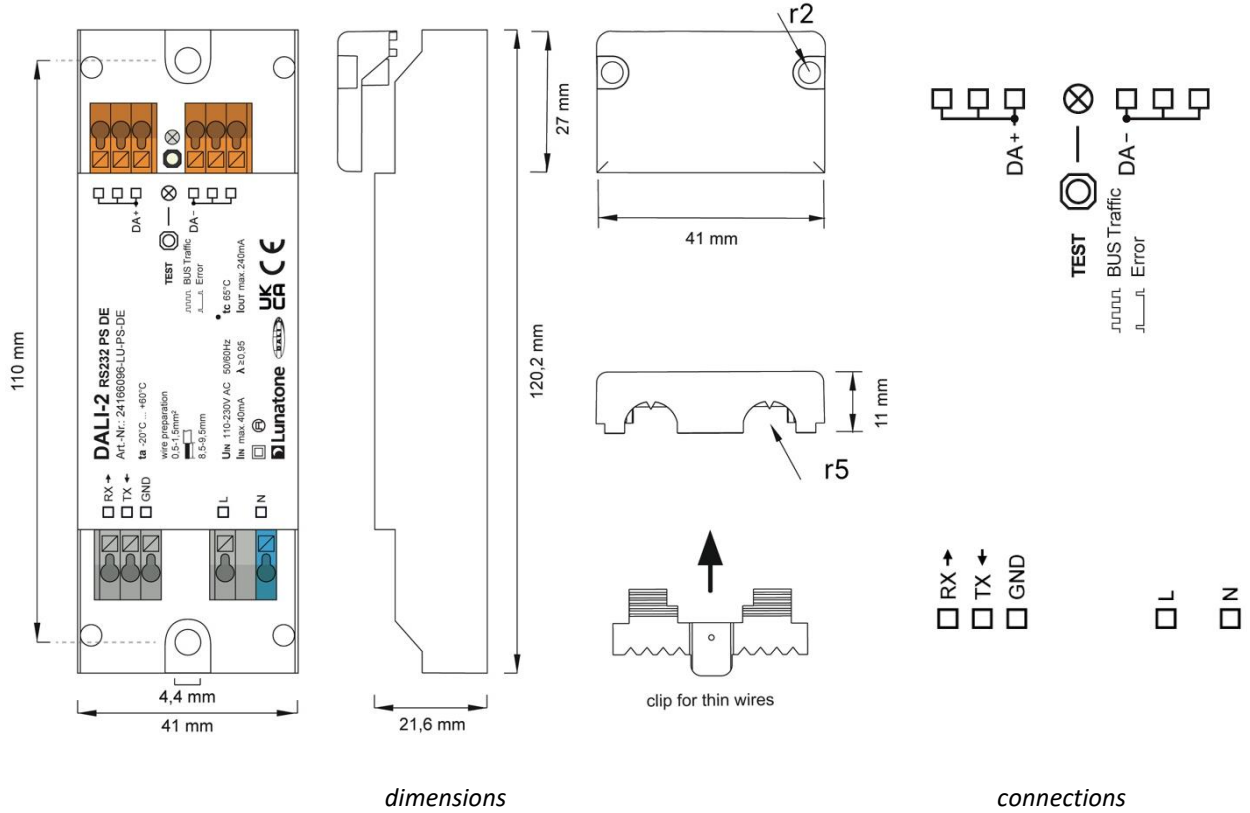
dimensions
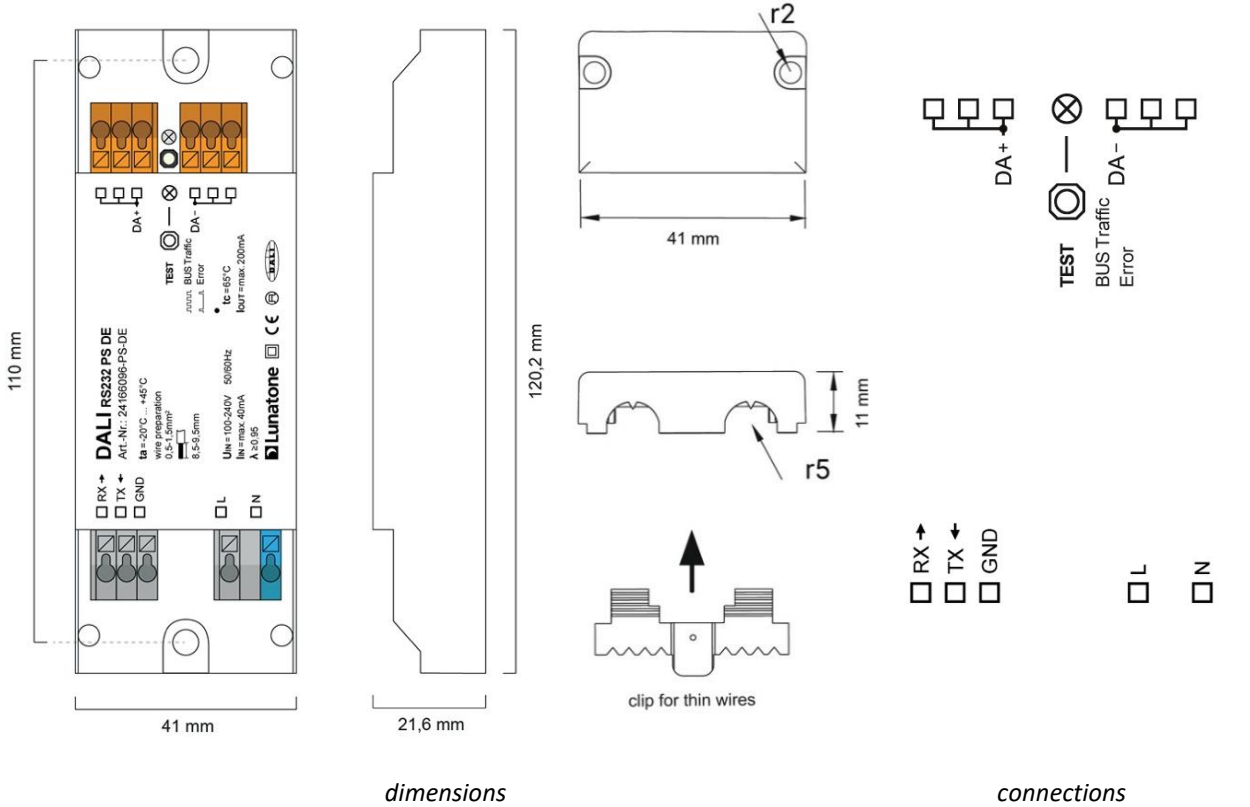
connections

DALI-2 RS232 PS HS --- Art.Nr.: 24166096-**LU**-PS-HS
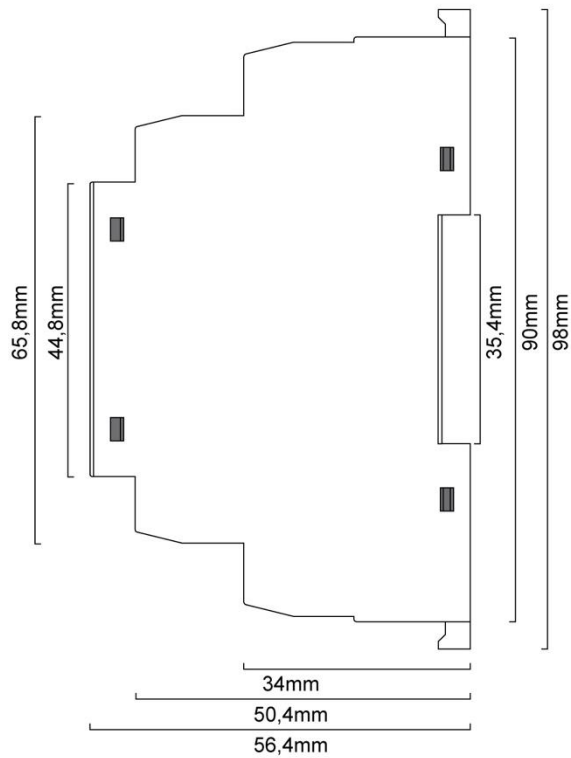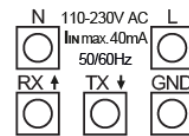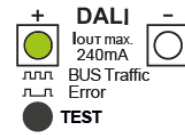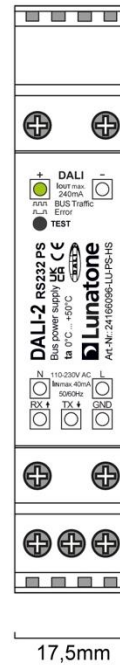
dimensions	*connections*

DALI RS232 PS HS --- Art. Nr.:24166096-PS-HS
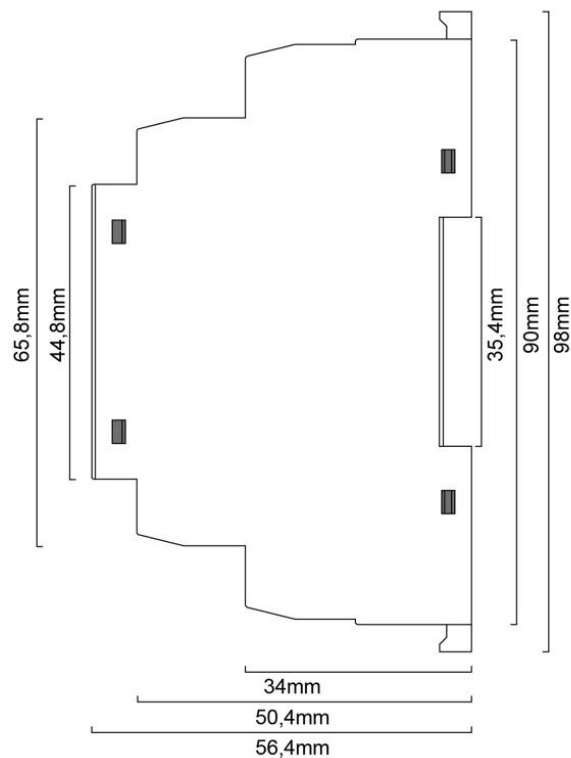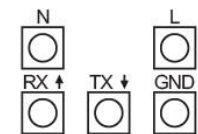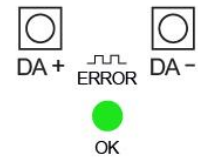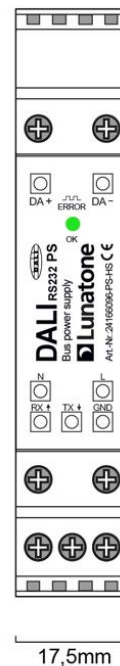
dimensions	*connections*

Connection, Installation

The connection to the DALI bus is polarity independent. For simple wiring, there are two sets of DALI terminals in the remote ceiling version (Art.: 24166096-PS-DE), the connected terminals are marked on the housing.

The DIN Rail version (Art. Nr.: 24166096-LU-PS-HS) has a test button for checking the wiring. Pressing the test button all luminaires connected to the DALI system will be controlled:

- Short press: the LED on the device is flashing and a test sequence (on, off, dimming) is started.
- Long press: ON – 100%
- Second press: OFF and the test mode is ended.

The DALI RS232 interface has a galvanic isolation between RS232 and DALI.

RS232 is accessible via screw terminals for the DIN Rail version (Art. Nr. Addition: -HS) and spring terminal for the remote ceiling version (Art. Nr. Addition: -DE).

The terminals L and N have to be connected to the mains supply according to their labelling (input voltage range: 110Vac … 240Vac).

There are also terminals for the communication signal (Rx, Tx, GND).

For connection of RS232 terminals (SubD for connection to RS232 of a PC) see *Figure 1* below.
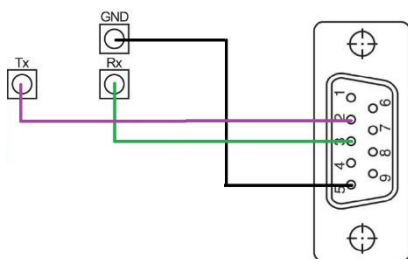
Figure 1 Connection of RS232

Interface Configuration

To ensure asynchronous communication with the interface, the following settings must be used for the transmission channel (38400,8,n,1):

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

DALI Specifications and Operating Modes

The DALI RS232 interface supports the transmission of Standard DALI commands as well as several proprietary protocol extensions:

- standard DALI (16Bit)
- standard DALI (8Bit), backchannel
- standard DALI-2 (24Bit, DALI-2) for control devices and event messages only with **LUBA** devices: Art.Nr. 24166096-**LU**-PS-DE /Art.Nr. 24166096-**LU**-PS-HS
- eDALI, special 25Bit protocol (24Bit Data) - Tridonic
- different bit numbers: e.g. 17Bit (special DALI frame by Helvar)

In addition to sending and receiving commands, the DALI RS232 also offers the option of monitoring and observing the DALI bus communication. During monitoring, all messages on the bus that correspond to one of the supported protocols are transmitted to the PC.

DALI Cockpit

With the free configuration and monitoring software for DALI systems, DALI- Cockpit, the full functionality of the DALI-2 SCI RS232 can be used without having to implement the transmission protocol yourself.

The new LUBA protocol and devices (Art. Nr. 24166096-LU-PS-DE and Art. Nr. 24166096-LU-PS-HS, Art. Nr. 24166096-LU-HS) are supported from DALI Cockpit Version: 1.38.60 and higher.

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

Communication Protocol – new: LUBA Protocol
Art. Nr. 24166096-**LU**-**PS-DE**
Art. Nr. 24166096-**LU**-**PS-HS**

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

A Python example project can be downloaded here:
www.lunatone.at/projects/LUBA/lubadevkit.zip

Communication Protocol - previous Protocol

Art. Nr. 24166096-**PS-DE**

Art. Nr. 24166096-**PS-HS**

An easy transmission protocol is implemented for communication with the DALI RS232 interface. Both forward and backward data frames between PC and interface each consist of 5 bytes:

Forward frame (command to DALI RS232):

8bit	8bit	8bit	8bit	8bit
Control	**Data_HI**	**Data_MI**	**Data_LO**	**CheckSum**

Control

bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
ME	identify /nDALI	Echo	0	0		MS	

bit 7:	monitor enable (ME)	**1**: Activate monitor function if activated, the DALI RS232 transmits all received DALI data to the PC
bit 6:	identify /nDALI	**1**: no data on DALI-line, communication only between PC and SCI2 **0**: DALI output enabled (data on DALI-line)
bit5:	Echo	**1**: Immediate response to PC (does not wait for an answer from the DALI-system) **0**: Wait for DALI response (max. 10ms, if no DALI-answer within this period, "NO" will be sent)
bit4:	N/A	not used, should be 0 to ensure compatibility with future versions
bit3:	N/A	not used, should be 0 to ensure compatibility with future versions
bit2-0:	mode selection (MS)	**0**: not used, reserved **1**: not used, reserved **2**: send DALI (8bit) in Data_LO **3**: send DALI (16bit), data in Data_MI, Data_LO **4**: send eDALI (24bit), data in Data_HI, Data_MI, Data_LO **5**: send DSI on DALI-line; 8 bit data in Data_LO, 16bit data in Data_MI, Data_LO **6**: Send 17bit DALI, 16bit in Data_MI, Data_LO; 17. bit in LSB of Data_HI (=last bit after DALI-frame) **7**: not used, reserved

Data_HI, Data_MI, Data_LO

The data is transmitted within these bytes. For detailed information check the selected mode (control byte, bit 3-0). Following, examples for mode 3, DALI 16bit:

To adjust brightness using a Direct Arc Power (DAP) command:

Data_LO: DAP value: 0-254

Data_MI: depending on the desired destination address:

	7	6	5	4	3	2	1	0
device address	0	address (0-63)						0
Group	1	0	0	group (0-15)				0
Broadcast	1	1	1	1	1	1	1	0
Broadcast unaddressed	1	1	1	1	1	1	0	0

To send a specific command:

Data_LO: value from the list:

Command	dec	hex
OFF	0	00
UP	1	01
DOWN	2	02
STEP UP	3	03
STEP DOWN	4	04
RECALL MAX	5	05
RECALL MIN	6	06
STEP DOWN and OFF	7	07
ON and STEP UP	8	08
enable DAP Sequence	9	09
GO TO LAST ACTIVE LEVEL	10	0A
GO TO SCENE 0	16	10
GO TO SCENE 1	17	11
...	...	...
GO TO SCENE 15	31	1F
RESET	32	20
REMOVE Address FROM SCENE 0	80	50
REMOVE Address FROM SCENE 1	81	51
...	...	...
REMOVE Address FROM SCENE 15	95	5F
ADD Address TO GROUP 0	96	60
ADD Address TO GROUP 1	97	61
...	...	...
ADD Address TO GROUP 15	111	6F
REMOVE Address FROM GROUP 0	112	70
REMOVE Address FROM GROUP 1	113	71
...	...	...
REMOVE Address FROM GROUP 15	127	7F

Data_HI: depending on the desired destination address:

	7	6	5	4	3	2	1	0
device address	0	address (0-63)						1
Group	1	0	0	group (0-15)				1
Broadcast	1	1	1	1	1	1	1	1
Broadcast unaddressed	1	1	1	1	1	1	0	1

We recommend checking the backward frame anyway to ensure that the DALI RS232 has processed the DALI command and is ready to receive a new one. The DALI RS232 does not have a buffer for commands.

CheckSum

XOR-ing the previously submitted 4 bytes.

Backward frame (Response from DALI RS232):

8bit	8bit	8bit	8bit	8bit
Status	**Data_HI**	**Data_MI**	**Data_LO**	**CheckSum**

Status

bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
identifier				0	status		

bit7-4:	Identifier	**6**: DALI SCI2 ID
bit3:	N/A	reserved, should be 0 to ensure compatibility with future versions

bit2-0:	Status	**0**: OK
		1: DALI answer "NO"
		2: DALI 8bit in Data_LO
		3: DALI 16bit in Data_MI, Data_LO
		4: DALI 24Bit in Data_HI,Data_MI,Data_LO
		5: DSI on DALI Data (8Bit if Data_MI=0; otherwise 16Bit in Data_MI,Data_LO)
		6: 17Bit DALI (16Bit in Data_MI, Data_LO, 17. Bit in Data_HI
		7: Error: checksum: Data=1;
		   DALI-Bus short circuit: data=2;
		   DALI receive error: data=3

Data und CheckSum

Data_HI, Data_MI, Data_LO and CheckSum comply with the rules of the forward frame.

Purchase Information

Art. Nr. 24166096-LU-PS-DE
DALI-2 RS232 PS240mA,
RS232 to DALI Interface with integrated bus power supply 240mA,
LUBA protocol
120x40x22mm, remote ceiling housing

Art. Nr. 24166096-LU-PS-HS
DALI-2 RS232 PS240mA Din Rail,
RS232 to DALI Interface with integrated bus power supply 240mA,
LUBA protocol
90x57x18mm, DIN Rail

Art. Nr. 24166096-PS-DE
DALI RS232 PS240mA,
RS232 to DALI Interface with integrated bus power supply 240mA,
outdated protocol
120x40x22mm, remote ceiling housing

Art. Nr. 24166096-PS-HS
DALI RS232 PS240mA DIN Rail,
RS232 to DALI Interface with integrated bus power supply 240mA,
outdated protocol
90x57x18mm, DIN Rail

Additional Information and Equipment

LUBA -Protocol description:
https://www.lunatone.com/wp-content/uploads/2021/04/LUBA_Protocol_EN.pdf

DALI-Cockpit – free Software for DALI system configuration and DALI line traffic monitoring.
https://www.lunatone.com/en/product/dali-cockpit/

Lunatone DALI products
https://www.lunatone.com/en/

Lunatone datasheets, manuals and software
https://www.lunatone.com/en/downloads-a-z/

Contact

Technical Support: support@lunatone.com

Requests: sales@lunatone.com

www.lunatone.com

Disclaimer

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

The function in installations with other devices must be tested for compatibility in advance.