wDALI-2

Extra Long Range

Remote & Receiver

Datasheet

Wireless DALI

Wireless control
of DALI systems

Remote	Art.Nr. 87313951
Remote labelled	Art.Nr. 87313951-L01
Receiver	Art.Nr. 87313917
Receiver PS	Art.Nr. 87313917-PS

wDALI-2 Extra Long Range Remote & Receiver

Overview

- Wireless control of a DALI line
- 2 modules: remote input device (with 4 pushbuttons) and receiver connected to the DALI signal line
- The input device can be placed anywhere in the radio receiver range.
- Range of the wireless connection is up to 800m outdoors, inside buildings, depending on construction 100m to 500m are possible.
- Factory default setting offers basic control functions
- Up to 4 effective ranges (Individual addresses, group addresses, or broadcast) can be assigned to each pushbutton.
- Various switching modes (short, long press; toggle; stairways function etc.),) and DALI-command can be assigned to each pushbutton.
- DALI DT8 support for colour and colour temperature control
- Configurable power up function
- Easy configuration with the DALI Cockpit Software and Lunatone DALI interface.
- Multiple input devices (max. 60) can be paired with the same transceiver, each paired device has the same function.
- An input device can be paired with several receivers in order to control multiple DALI-lines
- Multi-master capable: Several receivers can be installed within a DALI circuit.
- Version art.nr. 87313917-PS provides a 20mA DALI bus power supply for the subnet (up to 10 DALI ballasts).
- 2 sets of DALI terminals for easy connection - signal line can be looped through.

Specification, Characteristics

Remote

type	**wDALI-2 Extra Long Range Remote**
article number	87313951
general data	
dimensions (l x w x h)	128mm x 31mm x 12mm
wireless technology / policy	E-LORA 868 MHz / RL 2014/53/EU
supply	battery
estimated battery lifetime	10 000 actuations within 10 years[1]

[1] Theoretically determined value based on the technical specifications of the battery manufacturer.
The battery manufacturer is liable for the quality of the lithium battery used.

inputs	4 pushbuttons
operational ambient temperature	0°C…+50°C
storing and transportation temperature	-20°C…+75°C
protection degree housing	IP40

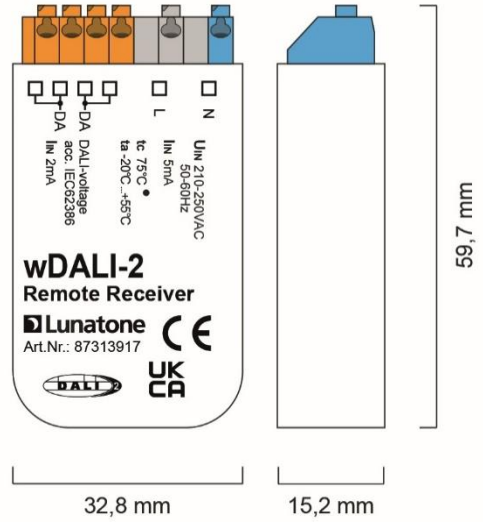
Receiver

Type	**wDALI-2 Extra Long Range Receiver**	**wDALI-2 Extra Long Range Receiver PS**
article number	87313917	87313917-PS
Input L,N		
input type	supply, mains- voltage	
marking terminals	L, N	
input voltage range	210Vac … 250Vac	
max input current	5mA	
input supply frequency	50-60Hz	
max. power consumption	max 2mA: 250mW	max 9mA / 1,2W
Output DA+,DA-		
output type	DALI control	DALI power supply 20mA (for up to 10 standard DALI-ballasts) DALI control
marking terminals	DA, DA	DA+, DA-
output voltage range according to IEC 62386	---	12,0Vdc … 20,5Vdc according to IEC62386
guaranteed DALI supply current	---	20mA
max. DALI supply current	---	250mA[2]
general data		
wireless technology / policy	E-LORA 868 MHz / RL 2014/53/EU	
dimensions (l x w x h)	59mm x 33mm x 15mm	
mounting	back box installation	
rated max. temperature tc	75°C	
protection class	II (when used/installed as intended)	
protection degree housing	IP40	
protection degree terminals	IP20	
terminals		
connection type	spring terminal connectors	
wire size solid core	0,5 … 1,5 mm² (AWG20 … AWG16)	
Wire size stranded wired	0,5 … 1,5 mm² (AWG20 … AWG16)	
wire size using wire end ferrule	0,25 … 1 mm²	
stripping length	8,5 … 9,5mm / 0,33 … 0,37inch	
release of wire	push button	

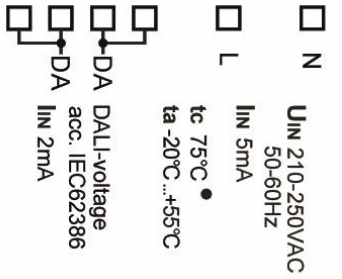
[2] adding an additional DALI bus power supply is not possible

environmental conditions:	
storing and transportation temperature	-20°C … +75°C
operational ambient temperature Ta	-20°C … +55°C
rel. humidity, none condensing	15% … 90%

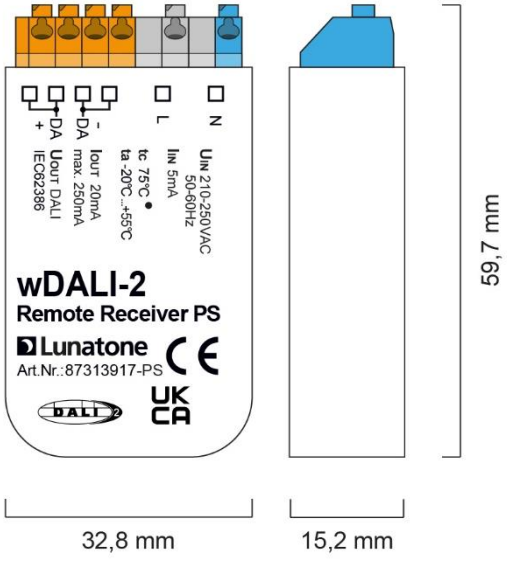
standards	
DALI	EN 62386-101
EMC	EN 61547 EN 50015 / IEC CISPR15
Safety	EN 61347-2-11 EN 61347-1
markings	CE



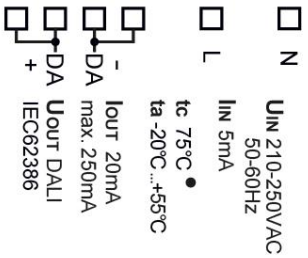
dimensions **wDALI-2 Extra Long Range Receiver**, 87313917



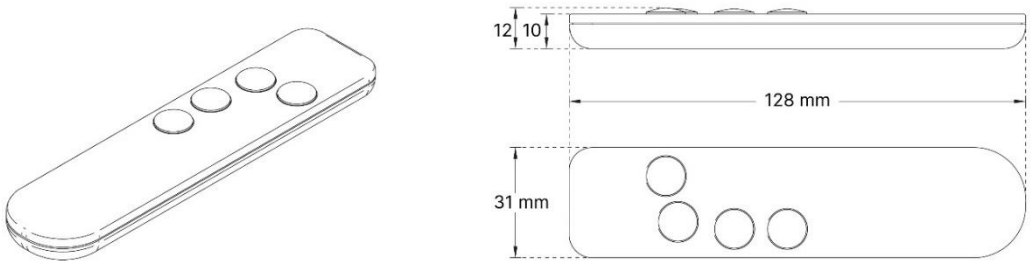
connection plan **wDALI-2 Extra Long Range Receiver**, 87313917



dimensions **wDALI-2 Extra Long Range Receiver PS**, 87313917-PS



connection plan **wDALI-2 Extra Long Range Receiver PS**, 87313917-PS



dimensions **wDALI-2 Extra Long Range Remote**

Typical Application

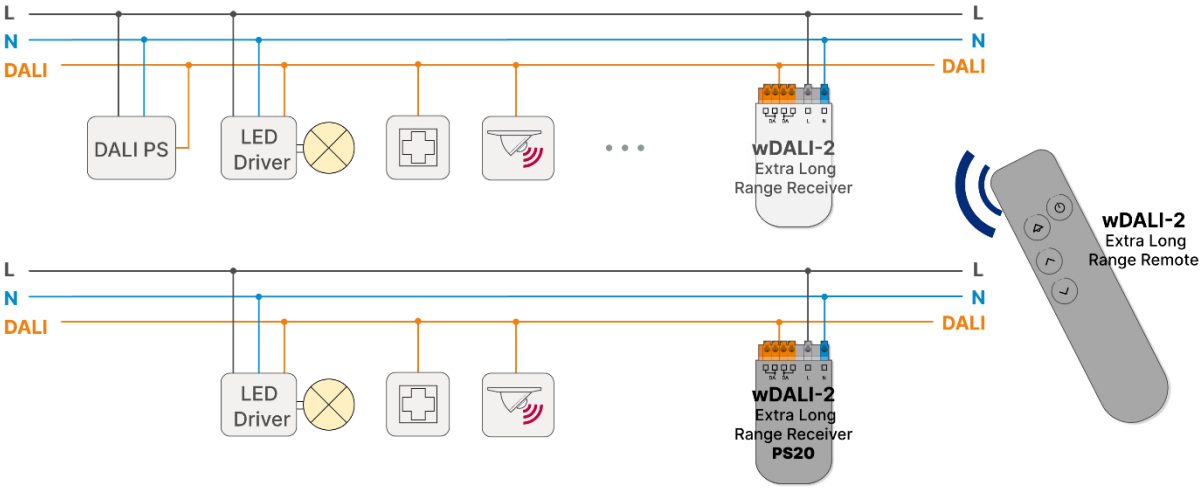


Figure 1 Typical application: wireless control of a DALI system

Factory Default Settings

A basic configuration is already implemented on delivery (factory default setting). If necessary, this can be changed and adapted.

	Button 1	Button 2	Button 3	Button 4
application controller	active			
effective range	Broadcast	Broadcast	Broadcast	Broadcast
button function	BF1: send CmdX	BF1: send CmdX	BF11	BF11
command X (CmdX)	OFF	RECALL MAX	UP (+ON & Step UP)	DOWN
command Y (CmdY)	n.a.	n.a.	UP	DOWN
command on power up	none	none	none	none
Scene interpretation	ignore	ignore	ignore	ignore

	Instance 0	Instance 1	Instance 2	Instance 3
instances – event messages	inactive			
Event scheme	Instance addresssing			
Event filter	short press, long press, repeat, stop, stuck			
Instance groups	None			
Timer				
Short press	400ms			
Double	-			
Repeat	160ms			
Stuck	20s			

Installation

- The wDALI-2 Receiver is intended for back box installation or in an enclosure, ensure proper cable relief for installation in protection class II devices.
- When installing and positioning, attention must be paid to the environment; metal housings and moisture impair the radio functionality. The antenna is located on the front of the housing (the side of the device with print). On problems with reception, check alternative orientation of the device.
- 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.
- Connect power supply terminals L and N to mains voltage according to the labelling.
- **wDALI-2 Extra Long Range Receiver PS:** the polarity of the output voltage is marked on the housing (DA+, DA-)
- **wDALI-2 Extra Long Range Receiver:** the connection to the DALI terminals can be made regardless of polarity.
- The DALI inputs are protected against overvoltage (mains voltage).
- 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 mains or a extra low voltage systems (SELV).
- 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.
- There are two sets of DALI terminals for easy connection, the signal line can be looped through.

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).

- Do not use standard DC power supplies on the DALI-line, since they do not meet the requirements for DALI communication.

Attention: an unsuitable DALI power supply can cause damage of the DALI devices!

Commissioning

- After installation, the device can already be used with the default factory settings. Depending on the model the Remote and Receiver need to be paired, which is described in section Pairing Remote and Receiver on page 7

- Addressing and changes to the factory settings, such as setting the effective range and functions, are possible with the Software tool DALI Cockpit (Windows PC).

- When using the DALI Cockpit Software, the PC must be connected to the DALI bus via a suitable interface module (DALI-2 USB; DALI USB, DALI-2 WLAN, DALI-2 Display, DALI-2 IoT, DALI 4Net, DALI SCI RS232). The device is automatically recognised by the DALI Cockpit during the addressing process and listed in the device overview. Effective range and desired functions can then be assigned to each input.

- The addressing is done according to the DALI-2 specification and the device receives a corresponding address.

- For localisation a buzzer is integrated in the device, or alternatively, a serial number visible in the DALI Cockpit “device info” is attached on the device.

- Physical selection: At the end of the addressing process: By double-clicking the physical button , the DALI Cockpit identifies and adds the input to the device list.

- An empty battery is indicated by the LED in the remote flashing 3 times

- Instance: Instance parameters can be configured according to IEC 62386-301, see section “instances” page 13

Pairing Remote and Receiver

The wDALI-2 Remote and Receiver can be paired with the DALI Cockpit:

1. Connect the DALI interface to the DALI bus and the PC and start the DALI Cockpit software.
2. Start device addressing. An address is assigned to the wDALI-2 Receiver and the device is displayed in the device tree.
3. Open the device page and select “Add…” in section “Pairing”. Input the pairing number which can be found on the remote control
4. press save to pair them with the Receiver

Multiple input devices, at maximum 60, can be paired with the same transceiver, each paired device has the same function.

An input device can be paired with several receivers in order to control multiple DALI-lines

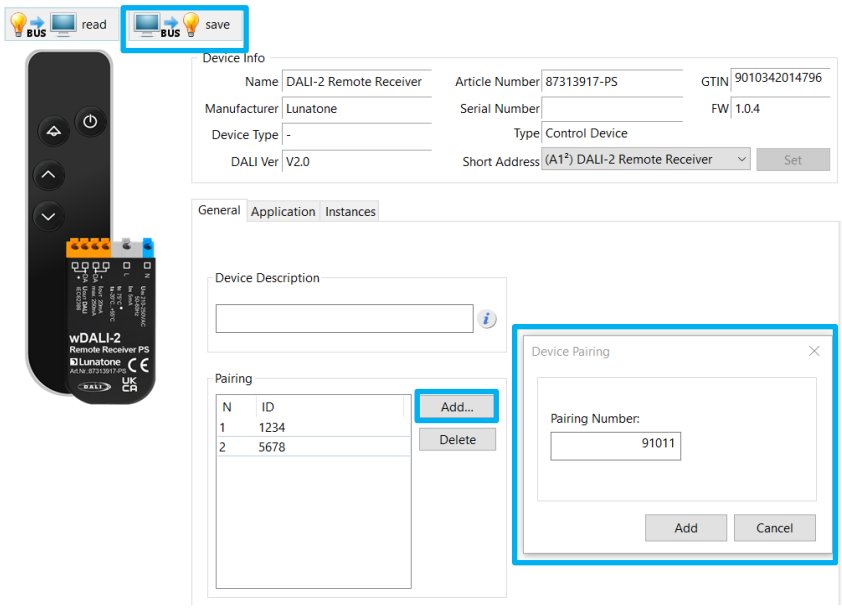


Figure 2 DALI Cockpit pairing Remote and Receiver

Operation and function

The DALI-2 Remote and Receiver are universal modules to control DALI-compatible lights. The function of each push button input can be set individually.

As with other Lunatone control devices, the settings can be made with the DALI Cockpit Software tool.

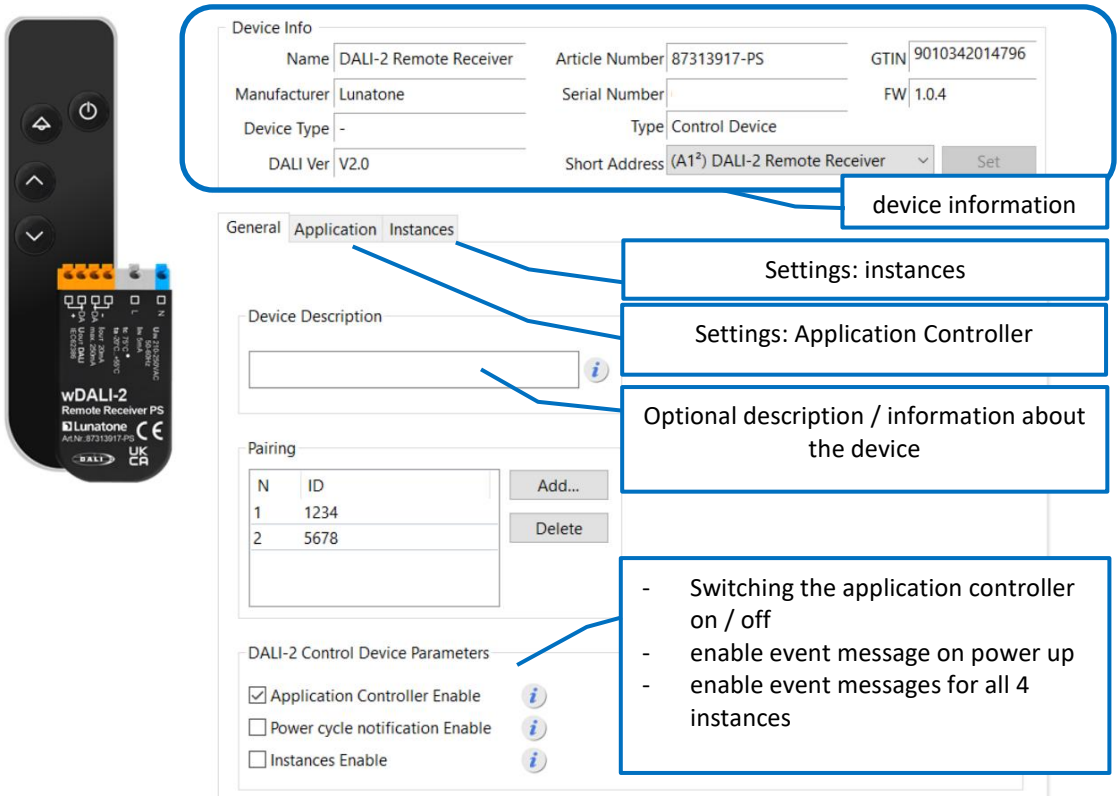


Figure 3 DALI Cockpit General Settings

It is necessary to distinguish between application controller and DALI-2 instances.

The application controller gives direct DALI control commands that are immediately executed by the DALI drivers. Configuration of the application is described in the section Application Controller - Configure inputs T1-T4, page 9.

The DALI-2 instances generate event messages that are interpreted and processed by higher-level control units (WAGO, Beckhoff,…).

(General information on the DALI-2 instance mode: https://www.lunatone.com/en/dali-2-factsheet/ section: DALI-2 Instancemode)

Configuration of the instances is described in section: DALI-2 Instances on page 14.

The Application controller and instances can be active at the same time.

Additional Information: A deactivated Application Controller is indicated in the DALI Cockpit device tree with: A.
A device with active instances is indicated with: i

Application Controller - Configure inputs T1-T4

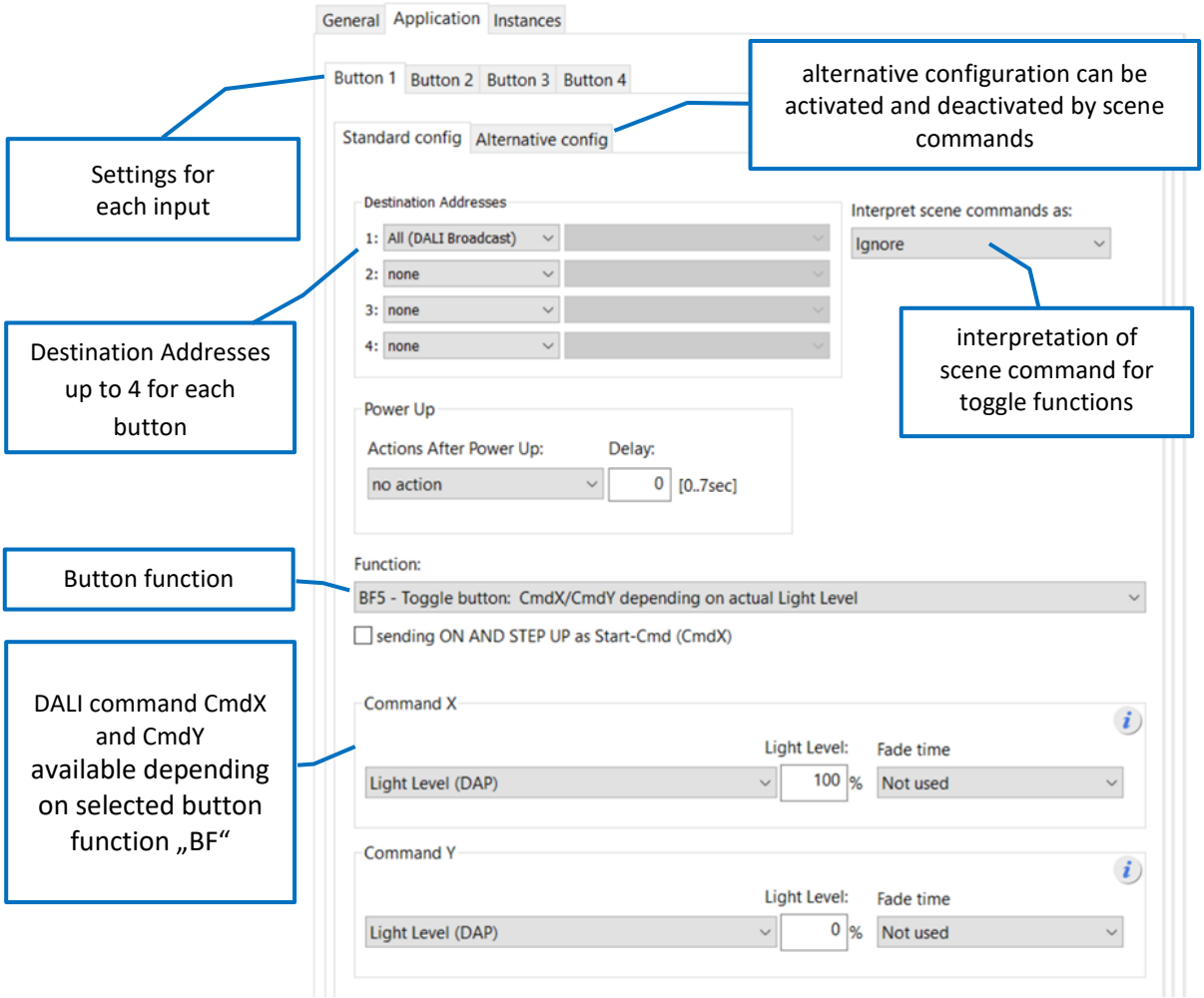


Figure 4: Application: Application Controller

Destination address / effective range

Here you can set which devices are affected by the button function. Possible destination addresses:

- Broadcast (an alle)
- DALI group (0 - 15)
- DALI single address (0 - 63)

Up to 4 different target addresses can be defined for each button input. When the button is pressed the target addresses 1 to 4 will be processed sequentially (see Fig. 4)

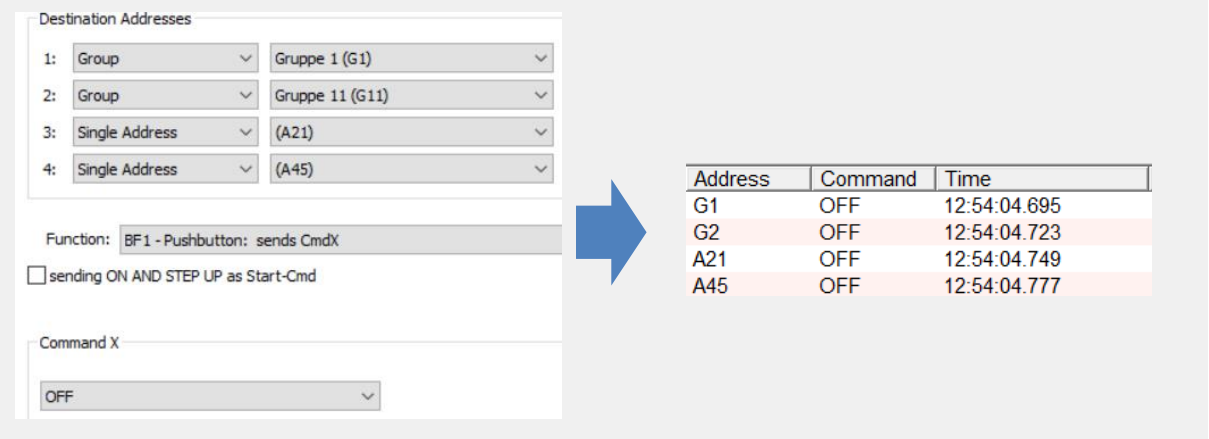


Figure 5 Example: Addressing Inputs 1-4 – sequentially processed

Button Function (BF)

Various "Button Functions" (BF) can be assigned to the individual buttons. The “Button Function" defines the behaviour of a button. A short or long press of the button can trigger different DALI commands. A toggle function (switching between on and off) is also possible.

Key presses (short / long) are queried according to the following timing diagram and translated into internal signals (**key events**):

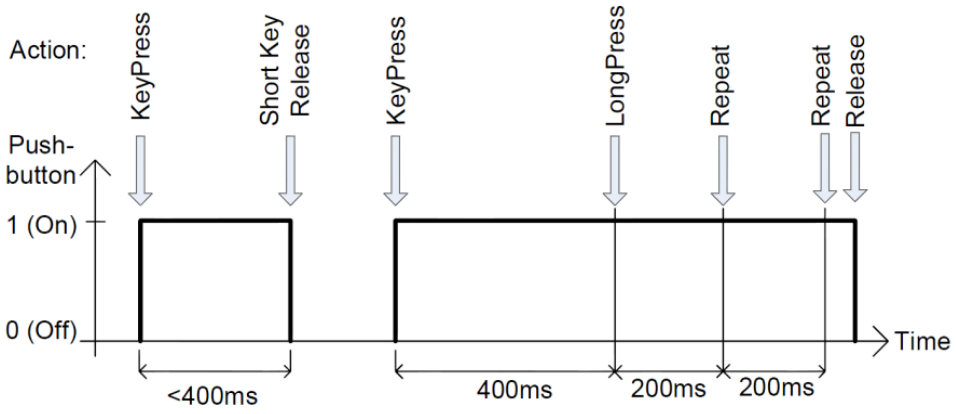


Figure 6 Key Events

The following table shows how the selected "Button Function" (lines 0 to 13) sends the commands **CmdX** and **CmdY** in connection with the "Key Events" (see Fig. 5). CmdX and CmdY refer to DALI commands.

☞ **Note:** The DALI commands are transmitted to all assigned target addresses.

button function number	**event: press**	**event: short press (release)**	**event: long press**	**event: extra-long press**	**event: repeat**	**function**	**typical application**
0	-	-	-	-	-	-	-
1	CmdX	-	-	-	-	sends CmdX on key press	master off
2	CmdX	-	CmdY	-	-	sends CmdX on key press sends CmdY on long key press	switch to 2 different levels
3	-	CmdX	-	CmdY	-	sends CmdX on key press sends CmdY on extra-long key press	store level as scene
4	CmdX / CmdY toggle	-	-	-	-	sends **alternating** CmdX and CmdY on key press	toggle push button
5	CmdX / CmdY **toggle**	-	-	-	-	sends **CmdX or CmdY** on key press **depending on bus status**	changeover button
6	-	CmdX / CmdY **toggle**	UP / DOWN	-	UP / DOWN	sends **CmdX or CmdY** on short key press **depending on bus status** sends alternating UP or DOWN on long press and repeat	push and dim
7	CmdX CmdY **on any release**		-	-	-	sends CmdX on key press sends CmdY on key release (after any duration)	switch
8	CmdX / CmdY toggle CmdY / CmdX toggle **on any release**	-	-	-	-	sends **CmdX or CmdY** on key press **depending on bus status** sends **CmdY or CmdX** on key release (after any duration) **depending on bus status**	changeover switch
9	CmdX **CmdY on delay**	-	-	-	-	sends CmdX on key press sends CmdY after a programmable delay	staircase control
10	-	CmdX	CmdY	-	CmdY	sends CmdX on short key press sends CmdY on long key press sends CmdY on repeat	push and dim
11	CmdX	-	-	-	CmdY	sends CmdX on key press sends CmdY on repeat	push and dim
13	-	CmdX / CmdY **toggle**	-	-	WARMER / COOLER	sends CmdX or CmdY on short key press **depending on bus status** sends alternating WARMER or COOLER on repeat	tunable white dim

Table. 1

Commands

The actual action (which function is triggered when pressing a button) is determined by the button function and command assigned to the button.

In most cases, an X command (CmdX) and also a Y command (CmdY) can be selected.

The following options are available:

Command number	Command name	action / function
no Nr.	DIRECT ARC POWER	direct arc power Level in %
0	OFF	off
1	UP	dim up (using fade rate)
2	DOWN	dim down (using fade rate)
3	STEP UP	increases light level by one increment
4	STEP DOWN	decreases light level by one increment
5	RECALL MAX	recalls MAX value
6	RECALL MIN	recalls MIN value
7	STEP DOWN AND OFF	decreases light level by one increment, if value at MIN switch off
8	ON AND STEP UP	increases light level by one increment, if OFF switch on
10	GOTO LAST ACTIVE LEVEL (DALI 2)	DALI-2-Cmd for switching on to the last active level (Memory-Function)
16-31	GO TO SCENE	go to scene 0-15

Table 2

Depending on the selected command, additional input fields might appear for further settings:

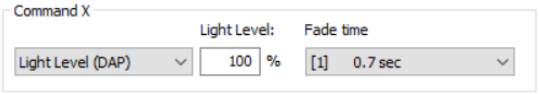


Figure 7 Example for CmdX: DAP additional inputs: Light Level and Fade time

Predefined macros:

Macros are predefined/ user defined command sequences that can be triggered by a single button press.

The following macros are available:

Nr	Makro	Funktion
M1	Go Home	Light dims down to DAP 0 with predefined fade time, then fade time is set back to a programmable value
M2	Sequential Scenes	A list of the scenes can be defined; the scene is switched with each button press.
M3	Dynamic Scenes	A dynamic sequence of up to 16 scenes can be defined, including custom fade times and delays.
M4	Save actual light level as scene	When triggered the current level is saved in a scene (options: light level, RGB colour value, WAF colour value or colour temperature).
M5	User Defined Cmd-List	A user-defined macro script with up to 19 commands is executed. (delay up to 3h from firmware 5.0 on)
M6	TC cooler	Activates the DT8 mode and sends the command “COOLER” 3 times.
M7	TC warmer	Activates the DT8 mode and sends the command “WARMER” 3 times.
M8	Send RGB +	Activates the DT8 mode and sends an ascending RGB color table value.
M9	Send RGB -	Activates the DT8 mode and sends a descending RGB color table value.
M10	Delayed Off	Sends a DAP level and after a delay the OFF command. DAP level and delay are user defined.

Table 3

M2: The selection “common scene list” allows the buttons (T1-T4) with M2 and this selection to continue switching the same scene list

M3, M5 and M10: the macro can be configured to be stopped by a scene command or an Off command. When selected the Macros are always stopped on seeing a scene or Off-command sent broadcast, or to the first destination address.

Interpretation of scene commands when using toggle function

In order to correctly trigger the on and off commands with the toggle function, scene calls must be interpreted correctly. It is possible to set whether a scene should be interpreted as Off or On (Fig 8).

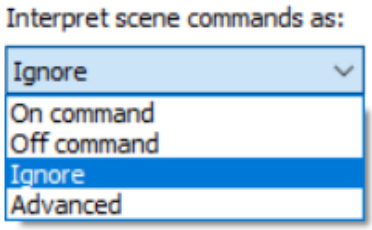


Figure 8.: Scene Interpretation

Behaviour on power-up

The behaviour when the device starts up can be defined for each input. The following settings are possible:

- No action: (the device starts and only sends commands when triggered by the input)
- Sending a configurable DALI command (light level, OFF, Max, Min, Scene, Go To Last Active Level)

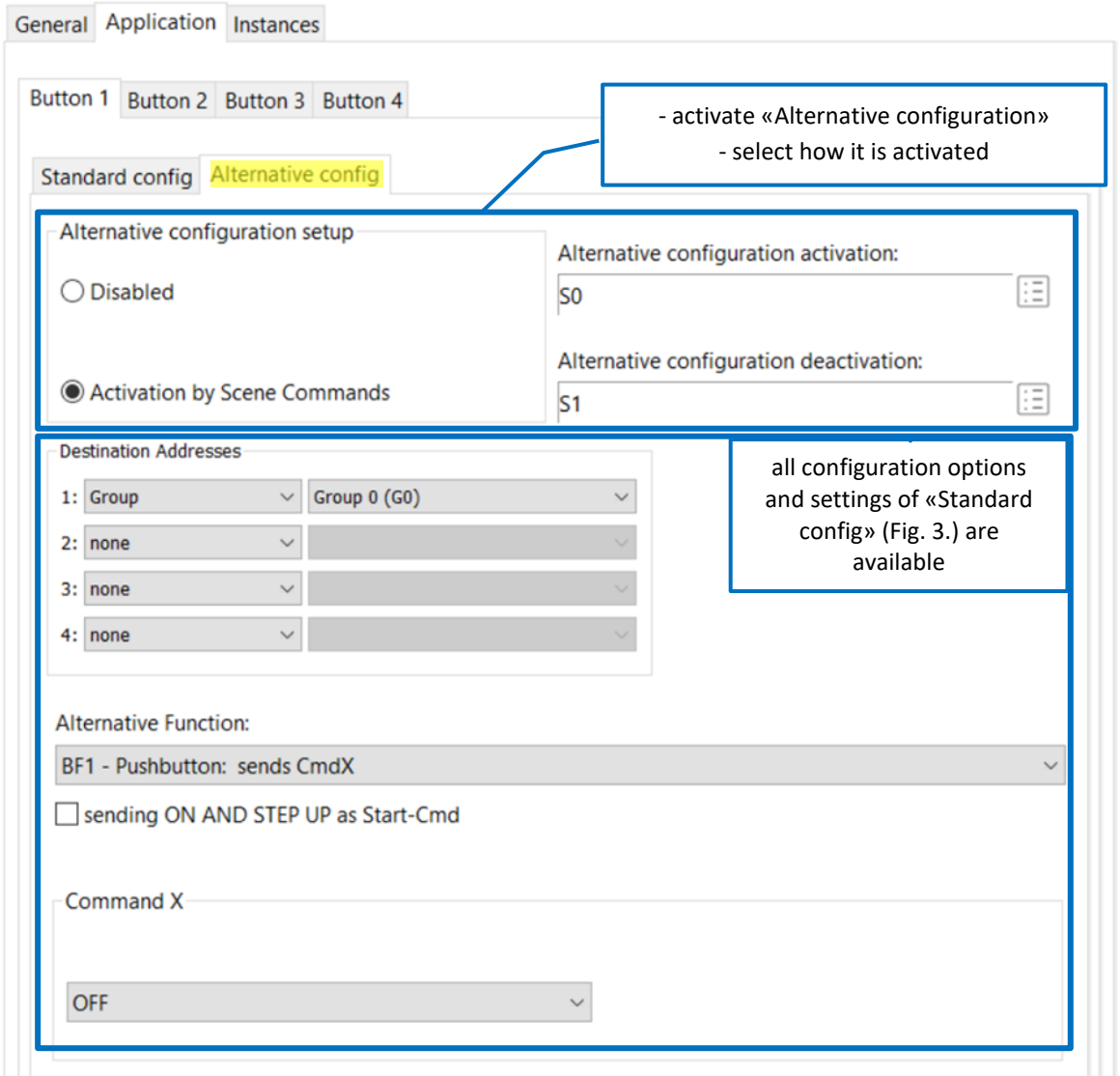


Figure 9 Settings for the alternative configuration

Alternative configuration
An alternative/second configuration can be made for each button. All previously explained configuration options and settings are available, except for macros, which are not available for the alternative commands. The alternative configuration can be activated with a scene command.

Activate / deactivate the "Alternative Configuration":

- **"Disabled":** the function is switched off, there is only the standard configuration

- **“Activation by Scene Commands":** scenes can be selected which will activate / deactivate the alternative configuration
  activate: the selected scene commands to the effective range of the standard configuration activate the alternative configuration
  deactivate: the selected scene commands to the effective range of the standard configuration and the effective range of the alternative configuration deactivate the alternative configuration.

DALI-2 Instances

In this operating mode, no DALI control commands are sent on the bus, but DALI-2 event messages for DALI-2 compatible central control systems.

The device supports 4 instances of type 1 (IEC62386-301, Input Devices - Push Button), which are assigned to the 4 button inputs

instance 0	input T1
instance 1	input T2
instance 2	input T3
instance 3	input T4

As defined in the standard, the following events are supported and sent on the DALI bus as INPUT NOTIFICATIONs, see Table 4.

Which events are sent can be determined using the event filter.
Further parameters of the instances 0-3 are: event filter, event timer settings (short timer, double timer, repeat timer, stuck timer), which can be configured via the DALI Cockpit Software, see Figure 9.

With which origin/address information the events are sent is determined with the instance-scheme.
General information on the DALI-2 instance mode and the instance types, event settings, event schemas etc. can be found in the instance guide:
https://www.lunatone.com/wp-content/uploads/2021/10/DALI-2_Instance-Guide_EN_M0024.pdf

Instances can be queried using Query Input Value. Pushbutton instances return the following values in response to a query:

button free	0x00	button not pressed / switch open
button pressed	0xFF	Button pressed / switch closed

Event name	Event Information	Description
Button released	00 0000 0000b	The button is released
Button pressed	00 0000 0001b	The button is pressed
Short press	00 0000 0010b	The button is pressed and released, without being pressed quickly again (in case of double press enabled), or the button is pressed and quickly released (in case of double press disabled)
Double press	00 0000 0101b	The button is pressed and released, quickly followed by another button press
Long press start	00 0000 1001b	The button is pressed without releasing it
Long press repeat	00 0000 1011b	Following a long press start condition the button is still pressed, the event occurs at regular intervals as long as the condition holds
Long press stop	00 0000 1100b	Following a long press start condition, the button is released
Button free	00 0000 1110b	The button has been stuck and is now released
Button stuck	00 0000 1111b	The button has been pressed for a very long time and is assumed stuck.

Table 4

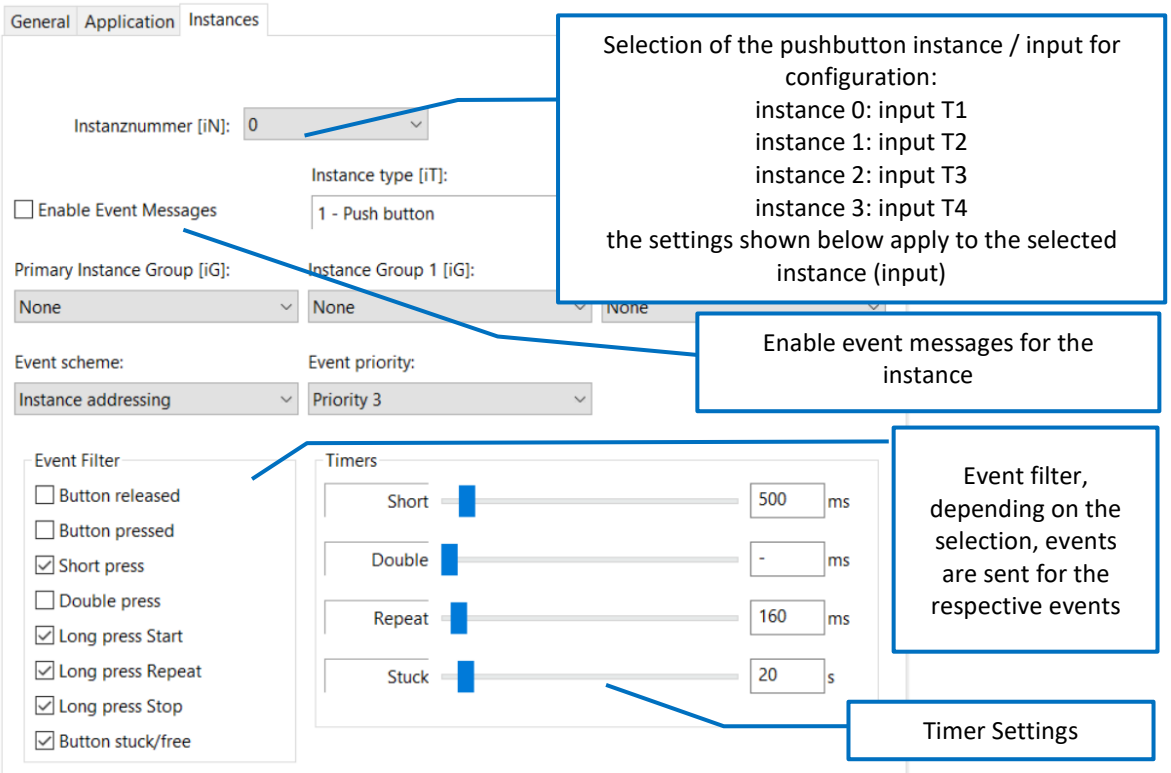


Figure 10: DALI Cockpit Instance Settings

Troubleshooting & FAQ

Bad reception, Control is not stable

- the device reception might be instable, metal and humidity impair the radio functionality, please try alternative installation/orientation.
- the battery on the remote might be empty – the LED on the remote flashed 3 times if the battery is empty

Purchase Information

Art. Nr. 87313951: wDALI-2 Extra Long Range Remote

Art. Nr. 87313951-L01: wDALI-2 Extra Long Range Remote with labelled buttons

Art. Nr. 87313917-: wDALI-2 Extra Long Range Receiver, back box installation

Art. Nr. 87313917-PS: wDALI-2 Extra Long Range Receiver PS, integrated 20mA DALI bus power supply, back box installation

Art. Nr. 87313951+R: wDALI-2 Extra Long Range Remote with paired Receiver

Art. Nr. 87313951+R-PS: wDALI-2 Extra Long Range Remote with paired Receiver PS (20mA)

Art. Nr. 87313951-L01+R: wDALI-2 Extra Long Range Remote with labelled buttons, with paired Receiver

Art. Nr. 87313951-L01+R-PS: wDALI-2 Extra Long Range Remote with labelled buttons, with paired Receiver PS (20mA)

Additional Information and Equipment

DALI-Cockpit – DALI system configuration tool, free when using a Lunatone interface device
https://www.lunatone.com/en/product/dali-cockpit/

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

Lunatone Datasheets and Manuals
https://www.lunatone.com/en/download s-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.

