

INTERNAL USE ONLY



BHAS - BUILDING & HOME AUTOMATION SOLUTIONS

KNX DALI Gateway Premium

DG/S x.64.5.1

2021-05 – Sascha Gerhardt, Gerd Schlag



KNX DALI Gateway Premium

Agenda

Goal & Motivation

- Information about the goal and motivation

News: DALI-2

- Information about the DALI-2 standard

Current product portfolio

- Information about our current portfolio

DG/S x.64.5.1 – Application V2.0

- Information about our new application V2.0

Sales Data

- Information about the sales



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Motivation

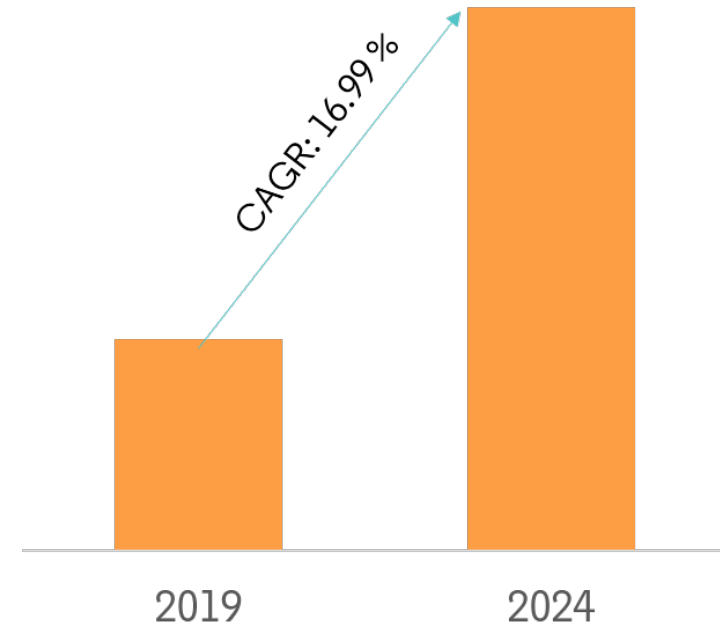
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Motivation

Development of the Lighting Control System Market

- The lighting control system market is expected to reach USD 42.79 billion in 2024 from USD 16.71 billion in 2019
- The major trends contributing to this forecast are as follows
 - Energy efficiency
 - Simple commissioning and simple control (also with the mobile phone) of the lighting systems
 - Adoption of the Internet of Things (IoT)
 - **Light colour temperature and RGB control systems**
 - Health related aspects of lighting in focus due to Covid

Lighting Control System Market Summary



Source: Mordor Intelligence





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News: DALI-2

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News: DALI-2

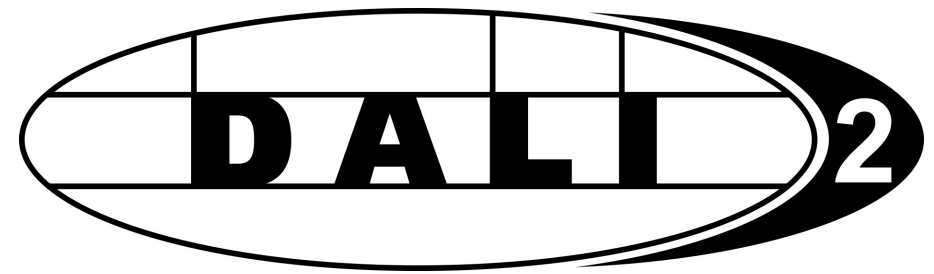
What is DALI?

DALI stands for **D**igital **A**ddressable **L**ighting **I**nterface and is a protocol set out in the technical standard IEC 62 386.

DALI was developed as an international industry standard for intelligent and easy management of lighting equipment

Changes from DALI to DALI-2?

- Extension for control devices
- New commands / features
 - extended fade-time
 - DALI Multi-Master
- Higher quality standards, increased testing procedures and thus higher compatibility
- Backwards compatibility



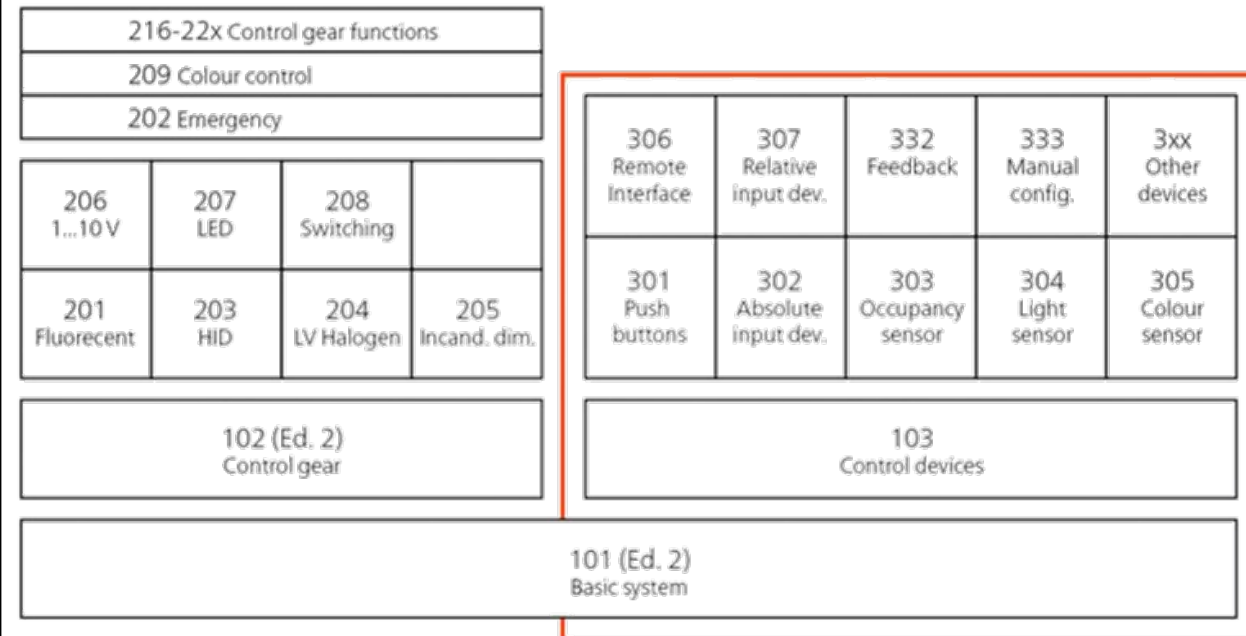
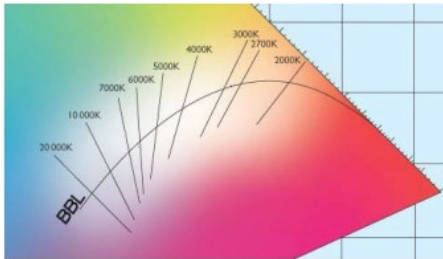
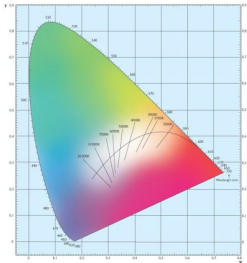
DALI-2 guarantees improved compatibility of DALI components.

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DALI-2

Main important DALI Device Types

- DT0 (part 201): Fluorescent lamps
- DT1 (part 202): Self-contained emergency lighting
- DT6 (part 207): LED-Module
- DT8 (part 209): Colour-/Colour temperatur control
 - XY-Coordinate
 - Colour temperatur Tc (tunable white)
 - Primary N
 - RGBWAF





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Current Portfolio

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Current portfolio



DG/S 8.1

- Broadcast control
- No addressing required
- 8 DALI channels
- max. 16 DALI devices per channel



DLR/S 8.16.1M

- Constant light control
- 1 DALI channel with max. 16 groups
- max. 64 DALI devices per channel
- 8 light sensors (LF/U2.1) can be connected



DLR/A 4.8.1.1

- Constant light control
- Decentralized solution (IP54)
- 1 DALI channel with max. 8 groups
- max. 64 DALI devices per channel
- 4 light sensors (LF/U2.1) can be connected



DG/S x.64.1.1

- Single/Group control
- Emergency light converter
- Max. 2 DALI channels
- max. 128 DALI devices
- Using templates
- **DALI-2 certified**



DG/S x.64.5.1

- Single/Group control
- Emergency light converter
- Max. 2 DALI channels
- max. 128 DALI devices
- Using templates
- **DALI-2 certified**
- **Colour temperature Tc**

2020/03

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Recent product highlights DG/Sx.64.5.1

Colour temperature Tc

Maximum flexibility and well-being living

“Tunable White”

- True independent fading of colour temperature and brightness level
- Set colour temperature
 - Colour temperature object
 - Percentage value object
- Relative dimming
- 2 presets for colour temperature
- Support of DALI device type 8
 - Colour temperature Tc



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Recent product highlights DG/Sx.64.5.1

Human Centric Lighting (HCL) & Dim2Warm

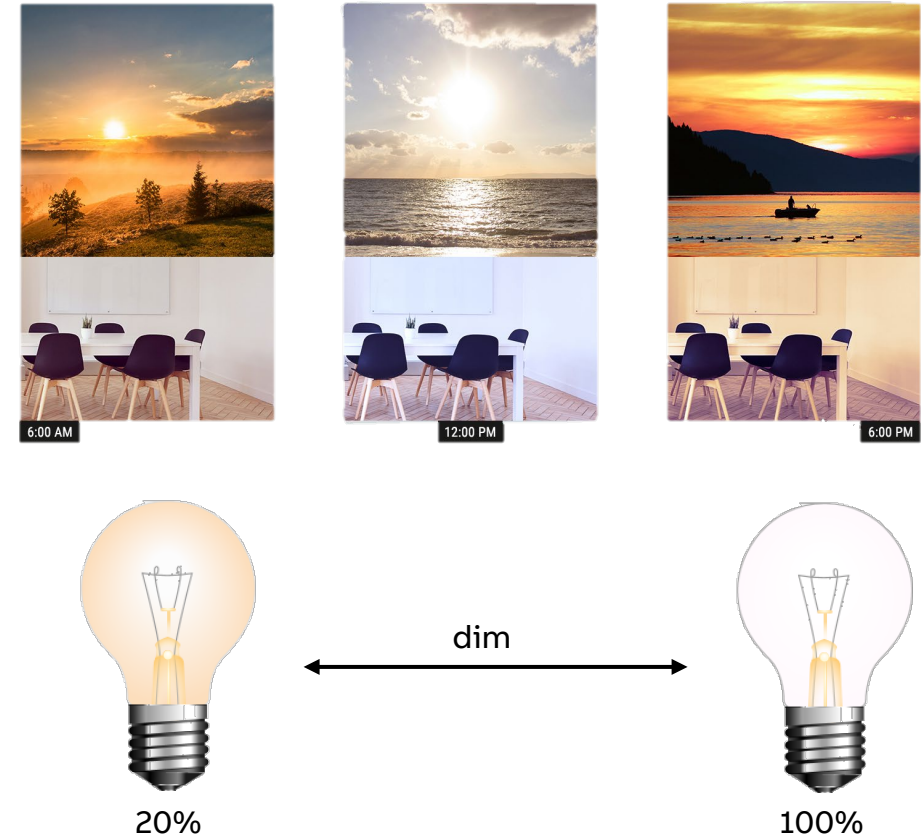
Changing colour temperature according to daylight & “Light bulb effect”

HCL..

- is a concept of biologically effective lighting
- supports long-term health and well-being
- has an impact on human's mood and productivity

With Dim2Warm the colour temperature changes proportionally to brightness

- The brighter the light the cooler the colour temperature
- The darker the light, the warmer the colour temperature



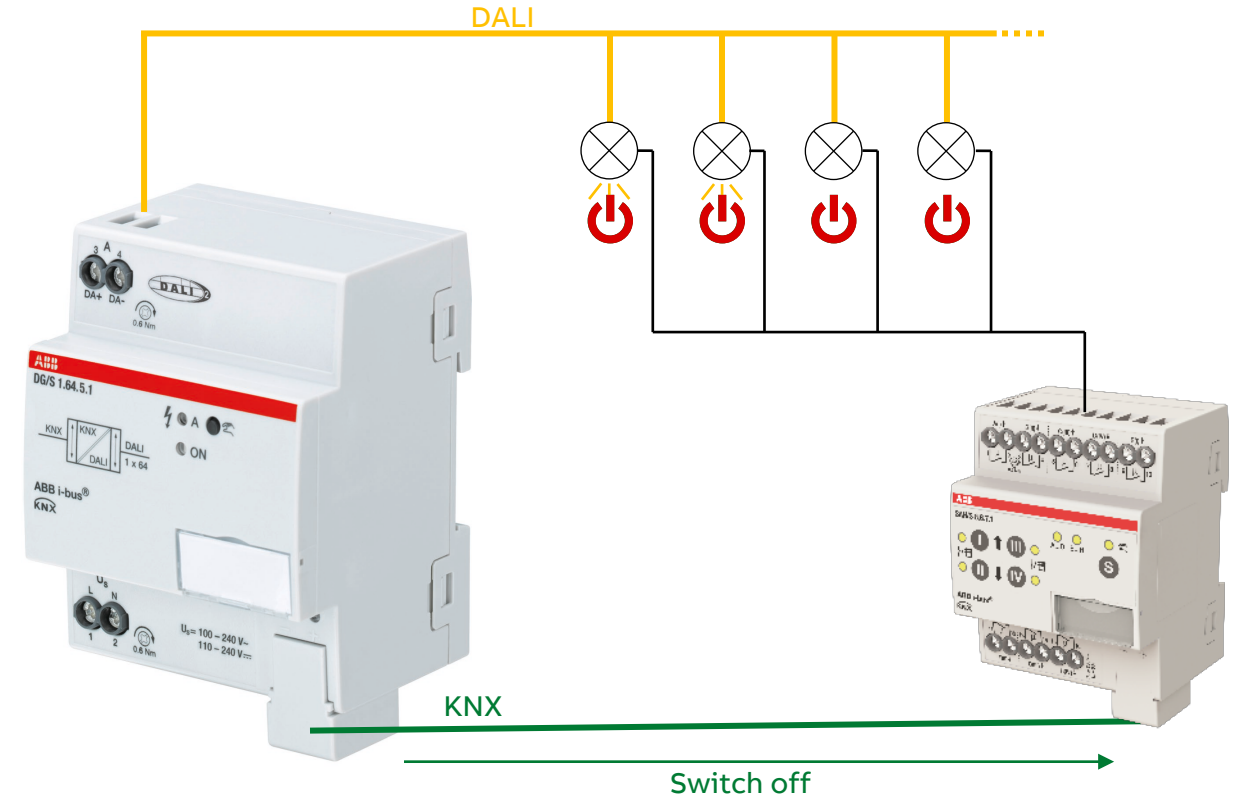
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Recent product highlights DG/Sx.64.5.1

Standby shutdown & additional functions

Reduce energy cost

- Switching off the ballast supply by a KNX switching actuator
 - Only possible, when all ballasts of a channel turned off
 - Configurable delay time
 - Optionally controllable via KNX object
- Single, group control and emergency lighting
- Template pages in ETS
- Long-frames support (same download time for more data)



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Recent product highlights DG/Sx.64.5.1

ABB i-bus® Tool – Binary search

Identify the right ballast faster

- Function to locate an unknown ballast faster
- The number of possible ballasts is halved from step to step
- Within only 6 steps the right ballast is selected

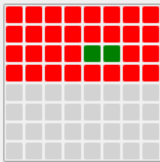
Search menu for a ballast with unknown address

Please press start button and answer yes/no upon the ballast's selection status

Note: Does not support emergency devices

Start Cancel

Step	Selected ballasts	Ballast selected?	Result
1	1..32		Yes
2	1..16		No
3	17..24		Yes
4	17..20		No
5	21..22	Yes No	
6			



Close

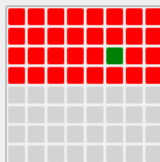
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2	1..16		No
3	17..24		Yes
4	17..20		No
5	21..22		Yes
6	21..21		No



There you go, it's ballast 22

Close

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DG/S x.64.5.1 - New Application V2.0

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DG/S x.64.5.1 - New Application V2.0

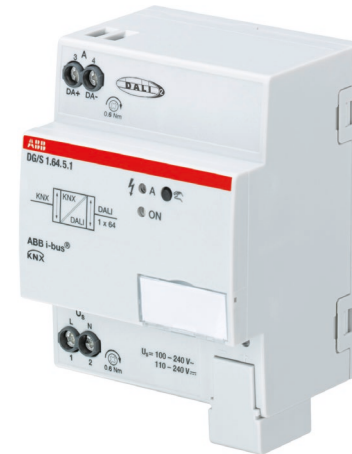
Goal

Our goal was to offer the customer new functions without changing the Hardware device.

With Application V2.0 new features are available

Milestone 1: Colour temperature Tc (launched March 2020) ✓

Milestone 2: Colour control RGBW (**new**)



1-fold



2-fold

Functional extension of KNX DALI Gateways Premium with new application V2.0

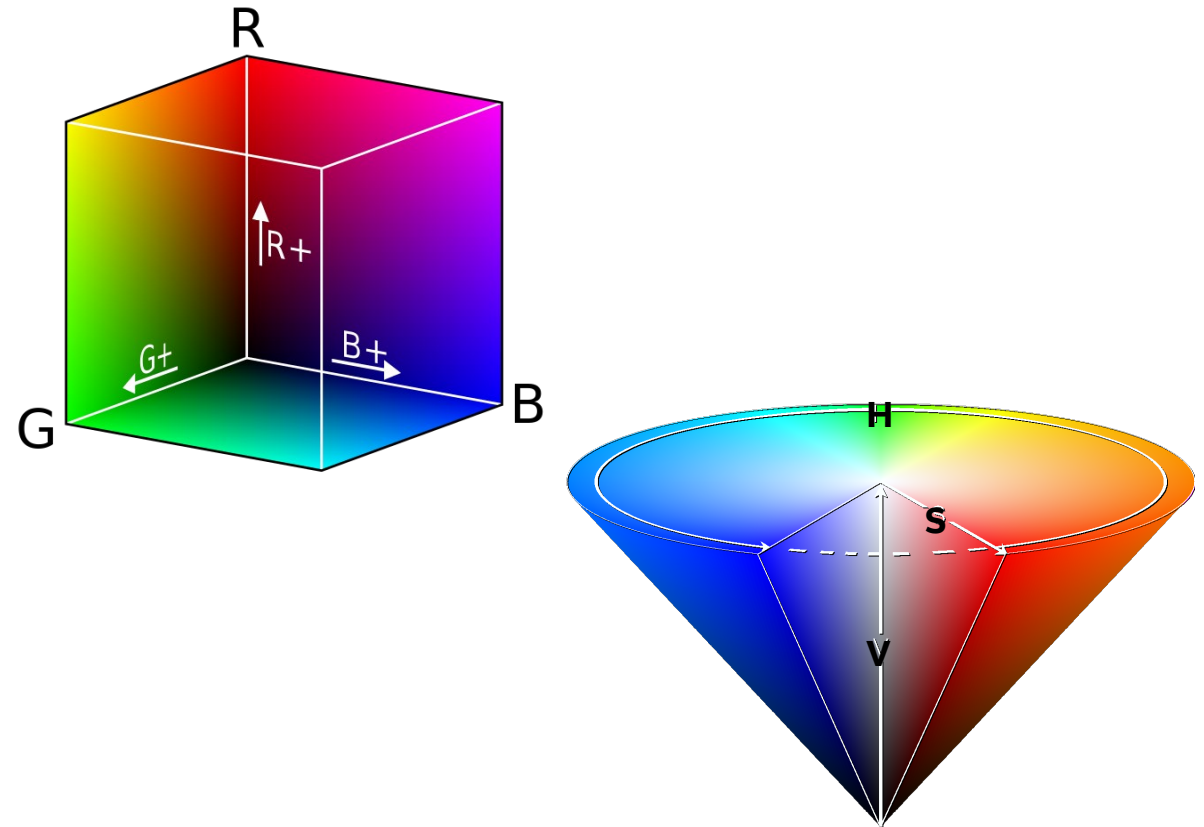
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DG/S x.64.5.1 - New Application V2.0

Colour control RGB(W) & HSV(W)

Maximum flexibility in lighting design

- Colour control for single and group control
- Dim colour value & set value
- Colour control is also possible using scenes
- Colour control is performed using
 - RGB(W)*
 - HSV(W)**
- The following options are available for colour control:
 - Single group objects for each colour channel (4x 1 Byte)
 - Combined group object RGB/HSV (3 Byte)
 - Combined group object RGBW/HSVW (6 Byte)



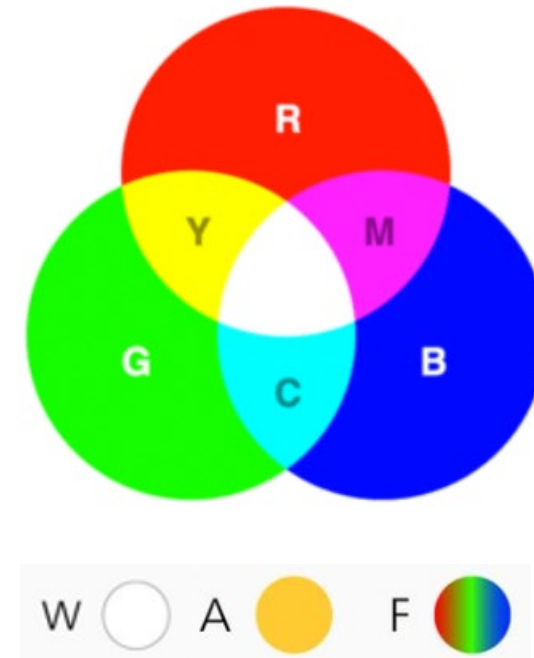
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DG/S x.64.5.1 - New Application V2.0

What is RGB(W)?

Colour control using the primary colors RGB plus W

- An **RGB LED** luminaire is based on the three-color theory, according to which almost all colors can be represented by mixing (additive mixing) three primary colors (red, green and blue).
- If these three colors are added together, the result is theoretically white.
- RGB LED luminaires often do not produce pure white light. To compensate this shortcoming, an additional white LED is integrated. The result is an **RGBW luminaire**.
- R = red pixel, G = green pixel, B = blue pixel
- Additional white pixel (= W) provides better white tone and higher brightness for colors.
- There are still special variants, **RGBWAF lights**:
A = Amber, F = other color



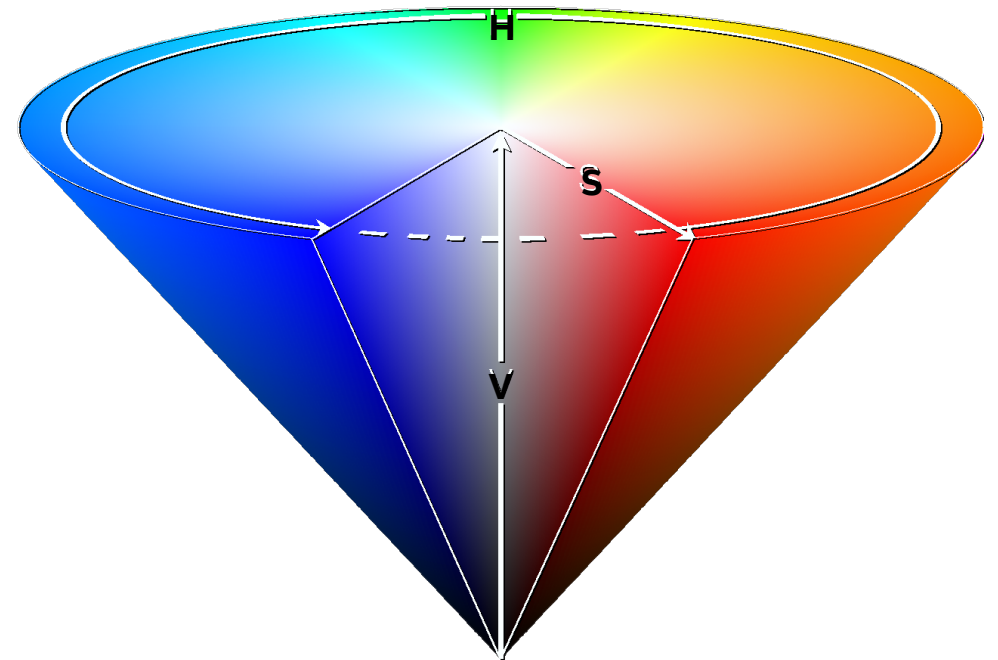
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DG/S x.64.5.1 - New Application V2.0

What is HSV?

Another variant of the colour control

- **H = Hue:**
is specified as an angle on the colour circle. It can therefore take on the values between 0° and 360° , where 0° corresponds approximately to the colour red, 120° to the colour green and 240° to the colour blue.
- **S = Saturation**
corresponds to the "admixture" of white and is given as a percentage. At 100% saturation, the colour is fully saturated - this is the pure colour. If white is added to the colour, the result becomes more pastel - the colour is less saturated.
- **V = Value**
is an approximate description of how much light comes out of the colour and is also given as a percentage. If the brightness is high, the colour appears bright and if the brightness is low, the colour appears dark. If the brightness is 0% this corresponds to black and at 100% to full brightness.



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DG/S x.64.5.1 - New Application V2.0

Sequencer

Lighting effects made easy

- 4 independent sequencers per output
 - Up to 10 sequence steps can be lined up in a row
 - Scenes
 - Groups
 - Ballasts
- Setting of
 - Transition time between sequence steps
 - Step duration
 - Number of passes (1 - 255, 0 = endless)
- Defined stop - behavior with end step

--- DG/S1.64.5.1 DALI Gateway,Premium,1f,MDRC > DALI output A > A Sequences > Sequence 1

General

DALI output A

A DALI configuration

+ A Output

+ A Group/ballast x template

- A Groups

+ G1 -

+ G2 -

+ A Ballasts

+ A Scenes

- A Sequences

Sequence 1

Number of steps: 10

Number of cycles (0...255, 0 = not limited): 1

Reaction on stop via KNX: ☒ End step ☐ Complete the cycle

Perform end step: ☐ No ☒ Yes

Scenes, groups and ballasts used must be enabled.
Colors must be supported by output/groups/ballasts.
Dimming time and step duration start simultaneously.

Step	DALI	No.	Brightness	Color type	Color value	White value	Dimmi time [s]	Step duration [s]
1	Output		100% (255)	HCL	3500 K		200	400
2	Scene	5					2	4
3	Group	5	100% (255)	RGBW	#A81B1B	200	30	600
4	Scene	9					2	4
5	Ballast	30	50% (128)	None			2	4
6	Group	1	100% (255)	Tc	2700 K		2	4
7	Scene	1					2	4
8	Scene	2					2	4
9	Scene	9					2	4
10	Group	10	100% (255)	RGB	#23BDA3		2	4
End	Output		0% (OFF)	None			2	4

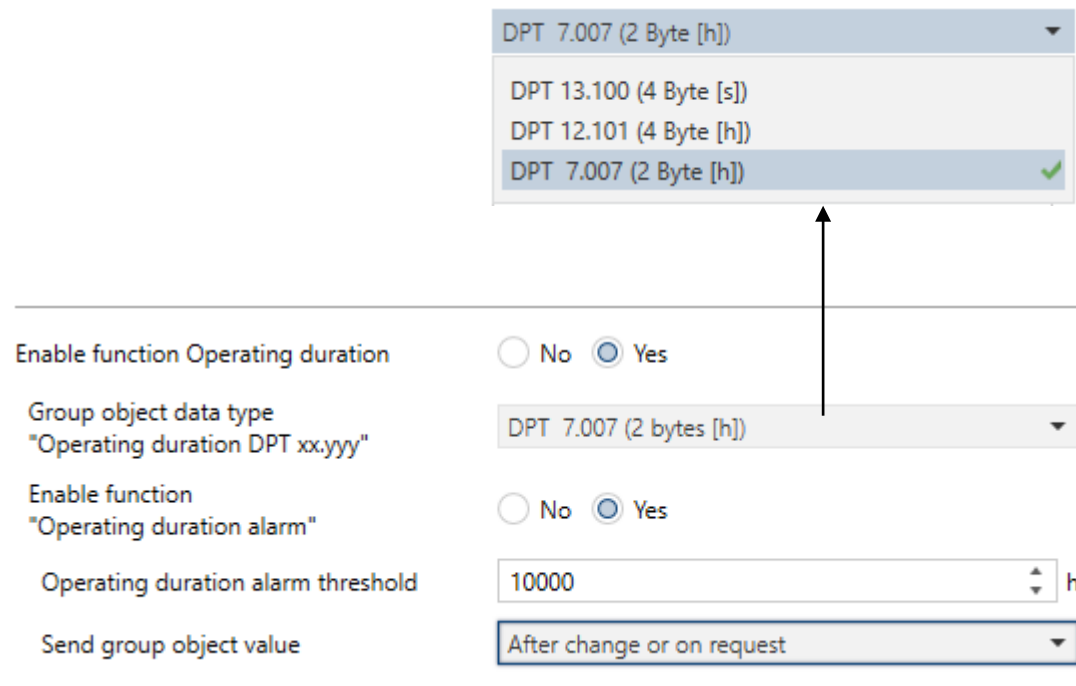
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DG/S x.64.5.1 - New Application V2.0

Recording of the operating time

Flexible maintenance cycles

- Integration of an operating hours counter per ballast
 - Different formats for recording the operating time
 - 2-byte (hours only) or
 - 4-byte group object (hours or seconds)
 - Additional addressable group object for operating time (1 address byte +2-byte for operating time in hours)
- Reset and presetting of operating time by writing to the group object
- Alarm when a parameterizable operating time is exceeded



DPT 7.007 (2 Byte [h])

DPT 13.100 (4 Byte [s])

DPT 12.101 (4 Byte [h])

DPT 7.007 (2 Byte [h]) ✓

Enable function Operating duration ☐ No ☒ Yes

Group object data type
"Operating duration DPT xx.yyy" DPT 7.007 (2 bytes [h])

Enable function
"Operating duration alarm" ☐ No ☒ Yes

Operating duration alarm threshold 10000 h

Send group object value After change or on request

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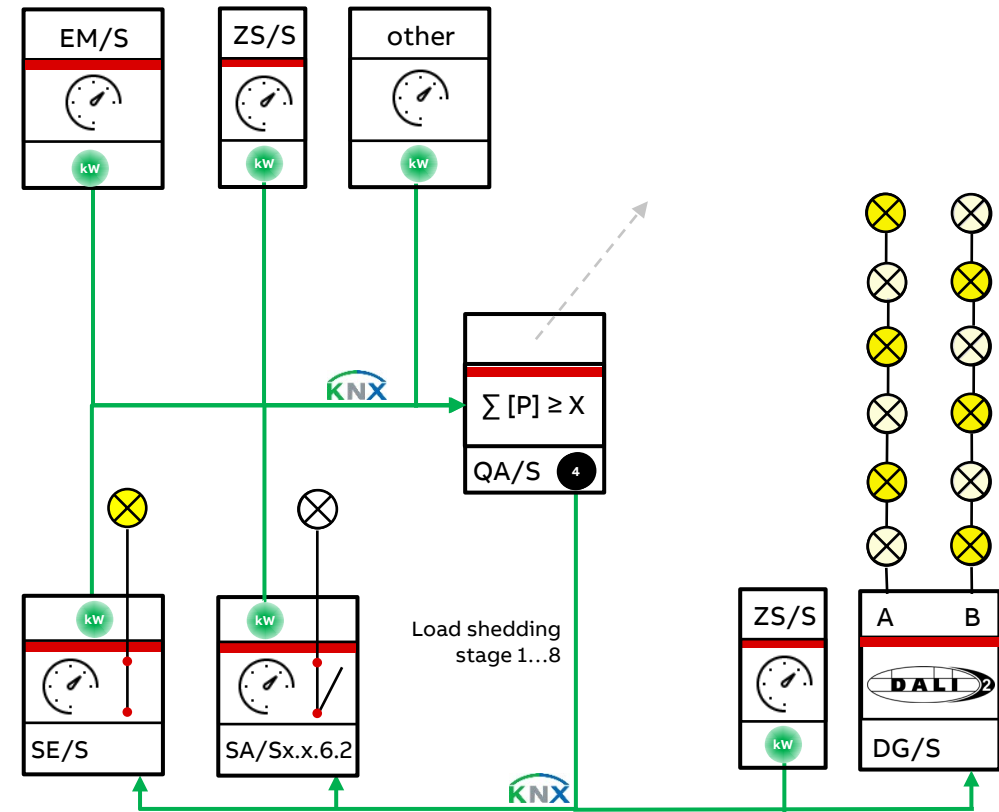
DG/S x.64.5.1 - New Application V2.0

Load shedding

Optimization of operating costs by avoiding load peaks

Integrating DALI Gateway into a load control system

- Selected loads are switched off in an overload situation to avoid load peaks and associated rate violations
- Consumption of the loads is recorded in the system and sent to a load management master (e.g. QA/S)
- Load management master sends a load level (**DPT 236.001**) to the actuators depending on the system situation.
- Depending on the load level, the actuator/DALI gateway switches off or dims down the consumers.
- By resetting or reducing the load level, the loads are switched on again



Animation ●

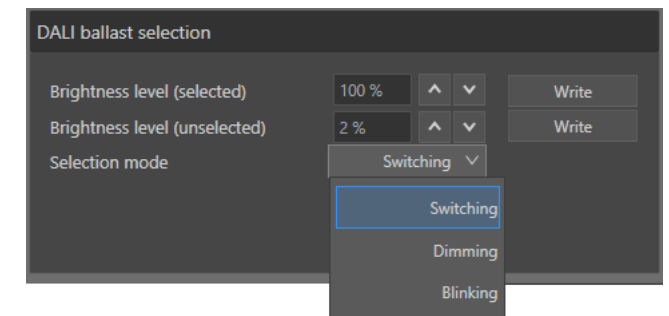
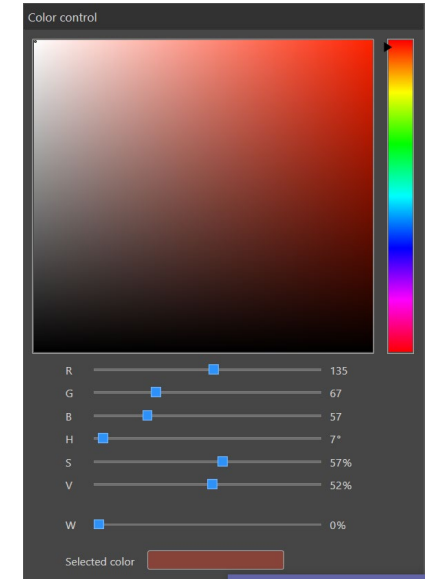
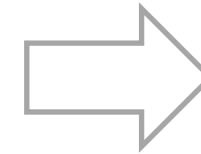
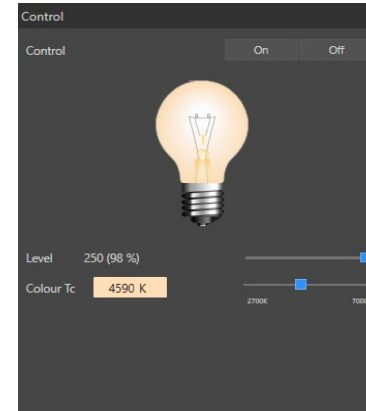
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DG/S x.64.5.1 - New Application V2.0

Enhancements in the ABB i-bus® Tool

Fast and intuitive diagnostic functions

- RGB(W) and HSV(W) diagnostics analog to the ETS interface
- Operating time status
- Optimized selection function
 - Only selected participant is changed:
Flashing, dimming
Non-selected participants remain unchanged
 - Emergency light converter can be recognized by function test during selection
- Monitoring of individual participants - not all at once
- Participant is fixed in the DALI address field at the same time





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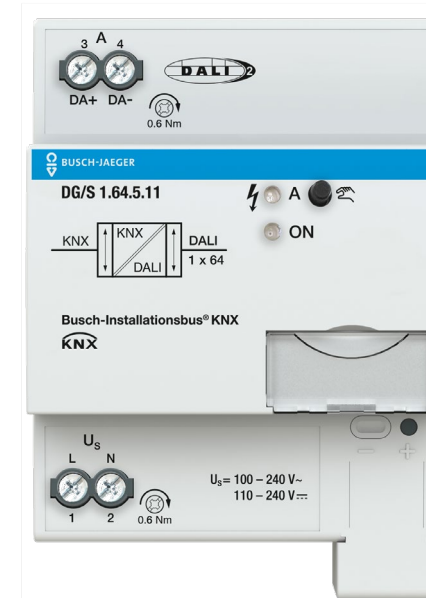
Sales Data

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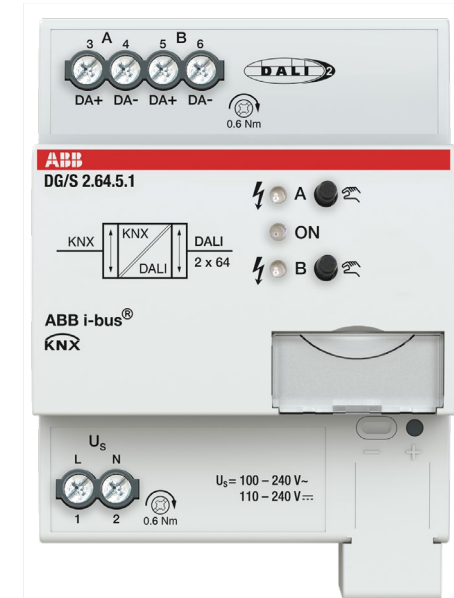
Sales data

Portfolio - DG/S x.64.5.1

Product	Order code	Application
DG/S 1.64.5.1	2CDG110273R0011	V1.4 (Tc) — available
DG/S 2.64.5.1	2CDG110274R0011	
DG/S1.64.5.11	2CDG110273R0021	V2.0 (RGBW) — Q2/2021
DG/S2.64.5.11	2CDG110274R0021	



DG/S 1.64.5.11



DG/S 2.64.5.1

ABB