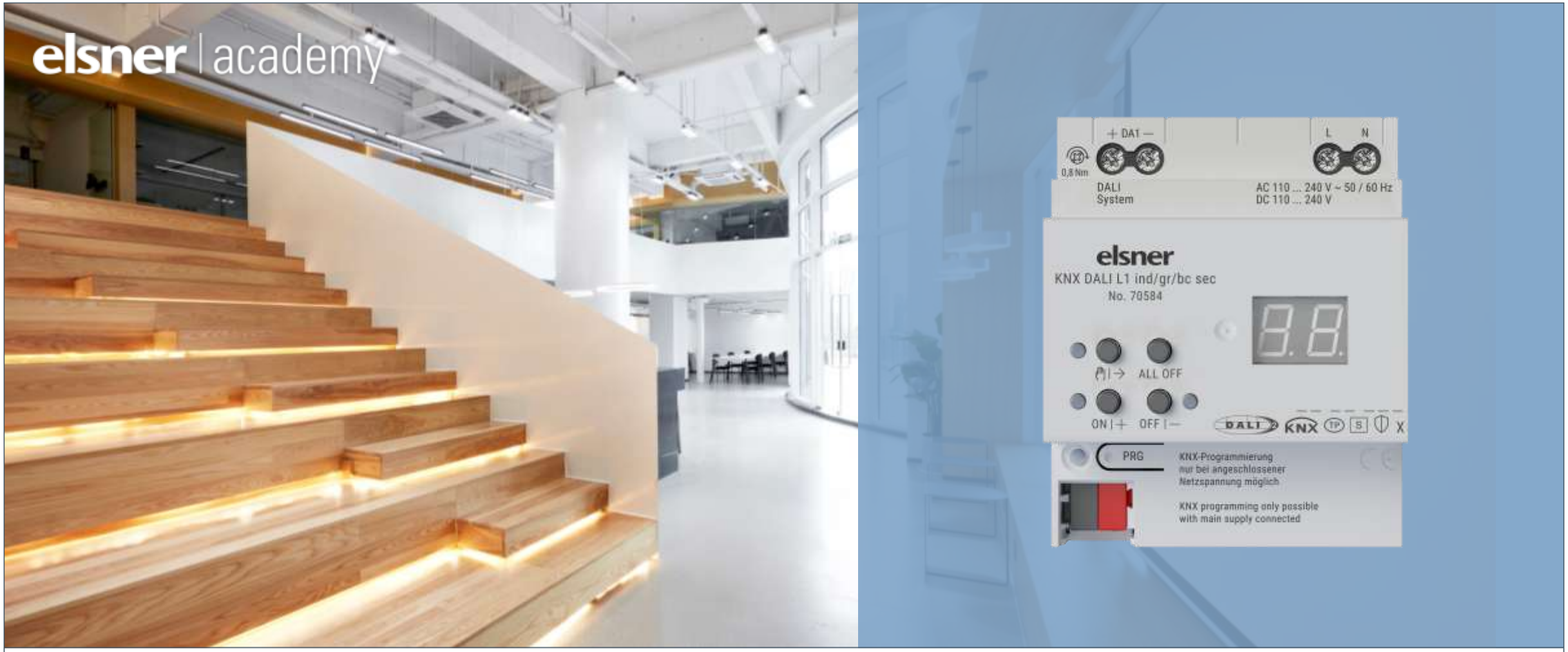


Lighting control with KNX & DALI

Practical knowledge for Planning and Integration

Frederick Riedel & Karim Bou Diab 19.11.25

» We are your speakers today!

Frederik Riedel

- Head and Trainer in Technical Service at Elsner Elektronik GmbH
- Support, Product Advice

Karim Bou Diab

- Application Engineer
- KNX & product applications support

Intro

Intelligent lighting solutions for comfort and atmosphere

- Have you ever noticed how cosy, amber-coloured lighting relaxes you?
- Or how a bright white light makes you alert?
- Now, imagine you could control your surroundings at the touch of a button.

Learning Objectives

| After this webinar, you will be able to

- ✓ Apply DALI fundamentals correctly
- ✓ Plan lightings effectively
- ✓ Save energy through automation
- ✓ Implement functions with DALI in practice

AGENDA

1. Basics of DALI & DALI-2
2. Energy savings with automation
3. Constant light control & lighting design
4. Product overview
5. Commissioning & configuration
6. Applications & practical examples
7. Troubleshooting in DALI

elsner

01 | Basics of DALI & DALI-2

Why should you use a DALI system?

| Here are a few reasons:

- Create a feel-good atmosphere
- Save energy
- Individual lighting control
- Scalability (hotels, industry)
- Flexibility

What is DALI today?

| Overview

- DALI = Digital Addressable Lighting Interface
- Internationally standardised bus system for lighting control (IEC 62386)
- Communication between control devices (e.g. sensors, buttons, gateways) and operating devices (e.g. ECGs, LED drivers)
- Two-wire bus cable, polarity-independent, in addition to mains voltage
- Flexible & manufacturer-independent (especially with DALI-2 certified)

DALI

DALI 2

Digital Adressable Lighting Interface

DALI-1

| Overview

- DALI = Digital Addressable Lighting Interface
- Internationally standardised bus system for lighting control (IEC 62386)
- Communication between **control devices** (e.g. sensors, buttons, gateways) and **operating devices** (e.g. ECGs, LED drivers)
- Two-wire bus cable, polarity-independent, in addition to mains voltage
- Flexible & manufacturer-independent

➢ defined by manufacturers

DALI-2

| Overview

- Extended & refined standard (IEC 62386, DiiA certification)
- Uniform interoperability between manufacturers
- Control devices (buttons, sensors) can also be integrated
- Expansion of Multimaster capability
- Quality standard achieved
- Backward compatible

➢ Certified by the DiiA - Digital Illumination Interface Alliance

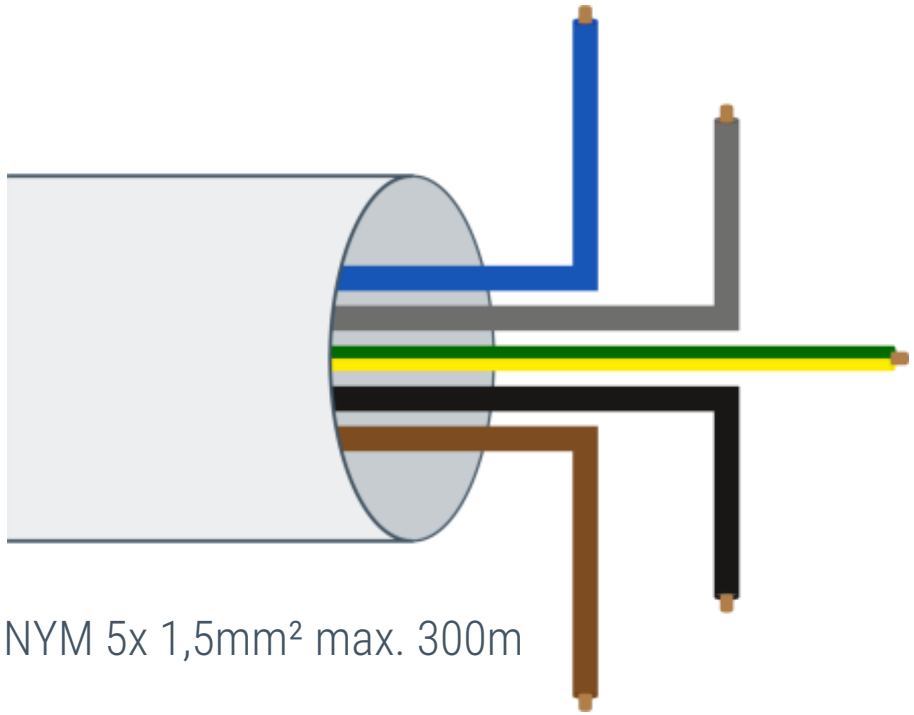
Features of DALI control gear

| Technical Standard Data

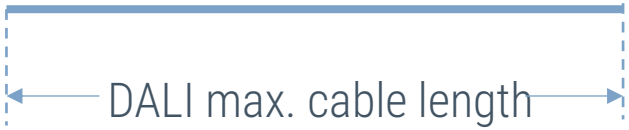
- Standardised digital interface according to IEC 62386
- Two-wire bus cable, no polarity → easy installation
- Addressable (single, group, broadcast)
- Scene control (up to 16 scenes can be stored)
- Status feedback (e.g. lamp failure, operating status)
- Compatible with various control devices (buttons, sensors, gateways) (especially DALI-2)
- Cross-manufacturer interoperability (especially DALI-2)

DALI-Installation

| Cable selection & Cable length



NYM 5x 1,5mm² max. 300m



Ø 0,50 mm²: <116 m

Ø 0,75 mm²: <174 m

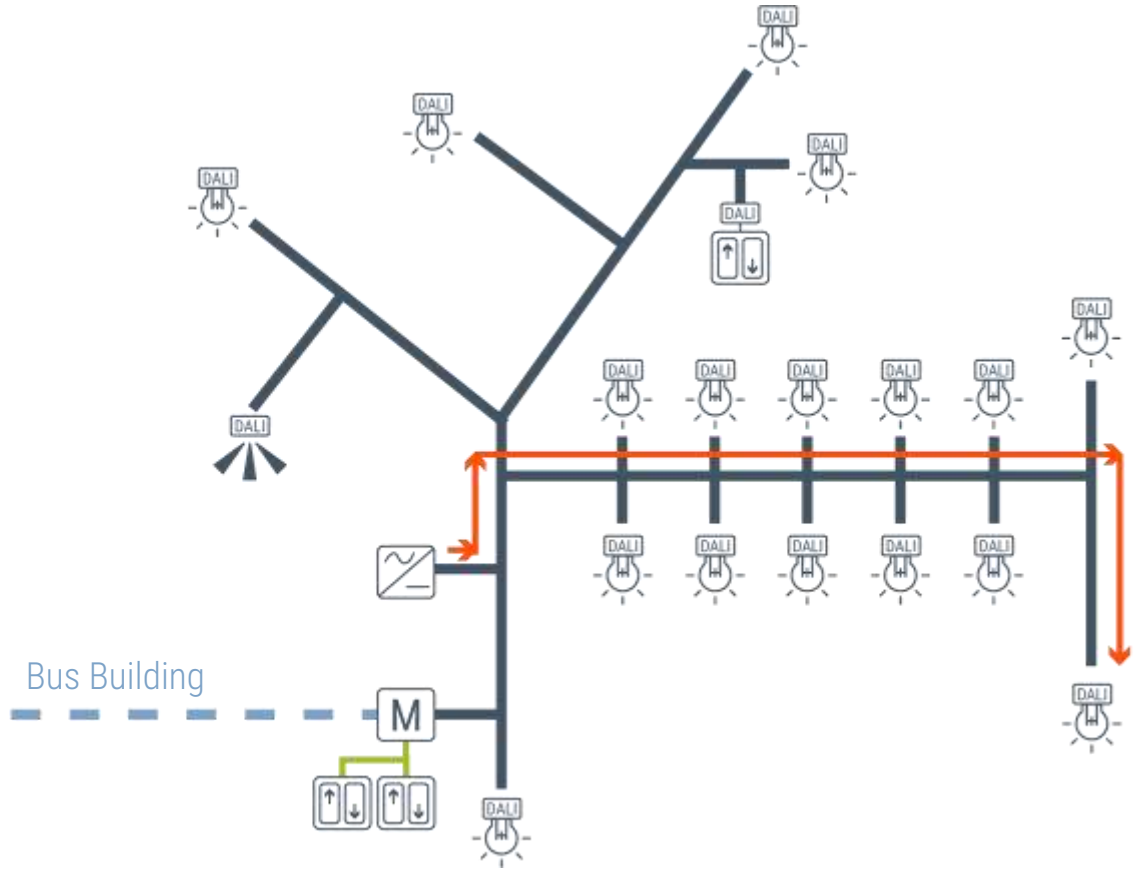
Ø 1,00 mm²: <238 m

Ø 1,50 mm²: <300 m

DALI-Bus Structure

| Summary

- A DALI-Line consists of
  - max. 64 Operating devices (ECG, LED drivers, etc.)
  - max. 64 Control units (Buttons, sensors, gateways) (Elsner DALI L1/L2 sec max. 32)
  - The bus is usually polarity-independent.
- Voltage range: 7V-22,5V, typically 16V-20V
- One DALI power supply per line recommended
- Topology (line, star, tree)

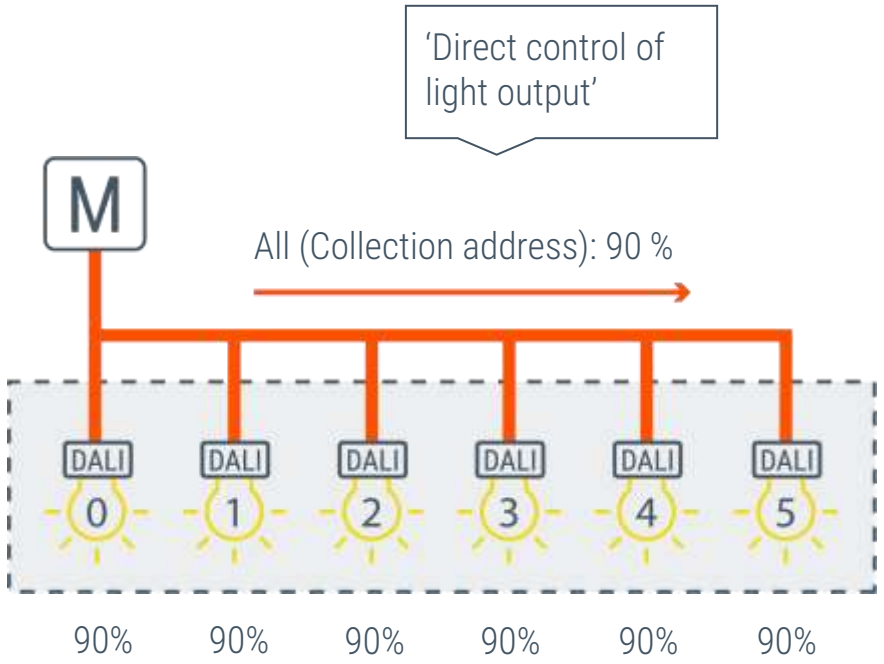


e.g. at 1.5 mm² | Max. 300m | Uv ≤ 2V | Base Insulation | No bus contract | No ring

DALI-Broadcast

| Means all are addressed

- Simultaneous control of all devices on a DALI line
- No addressing required ⟶ quick commissioning
- Ideal for simple applications (e.g. corridors, stairwells, warehouses)
- No group or scene assignment necessary
- All operating devices respond identically to broadcast commands.



Example

| For broadcast

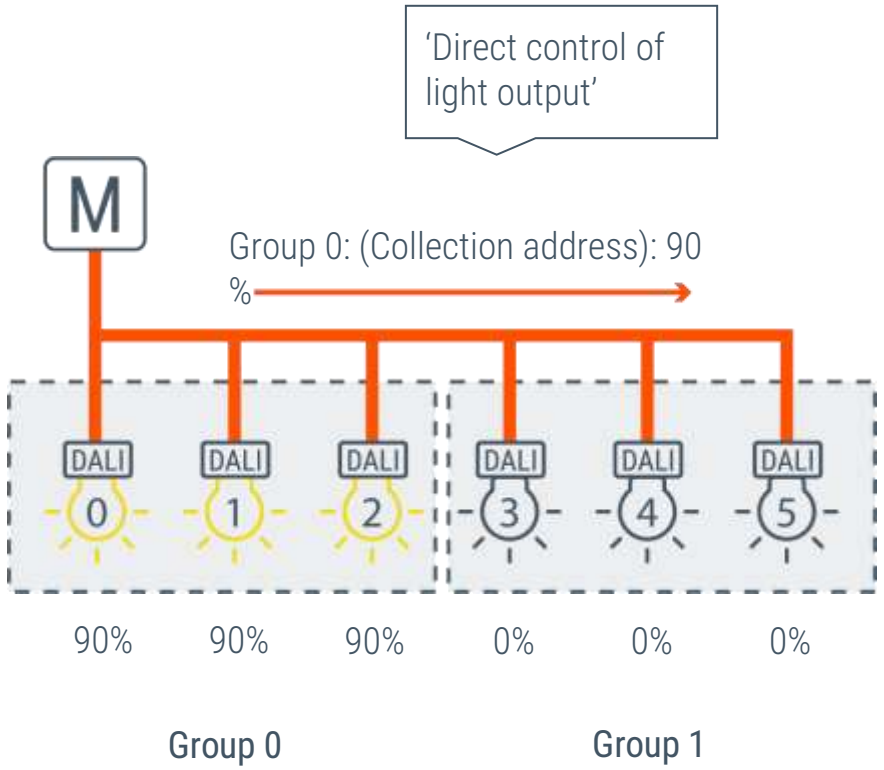
- Street lighting
- Industrial buildings
- Sports halls

➢ large-scale lighting systems (typical)

DALI-Multicast

| Means group control

- Addressing specific device groups within a DALI line
- Supports dimming, switching, scene recall per group
- More flexible than broadcast, as only all devices in a group respond
- Feedback possible: Devices can report status or errors
- Ideal for rooms, areas or groups of lights within a DALI system



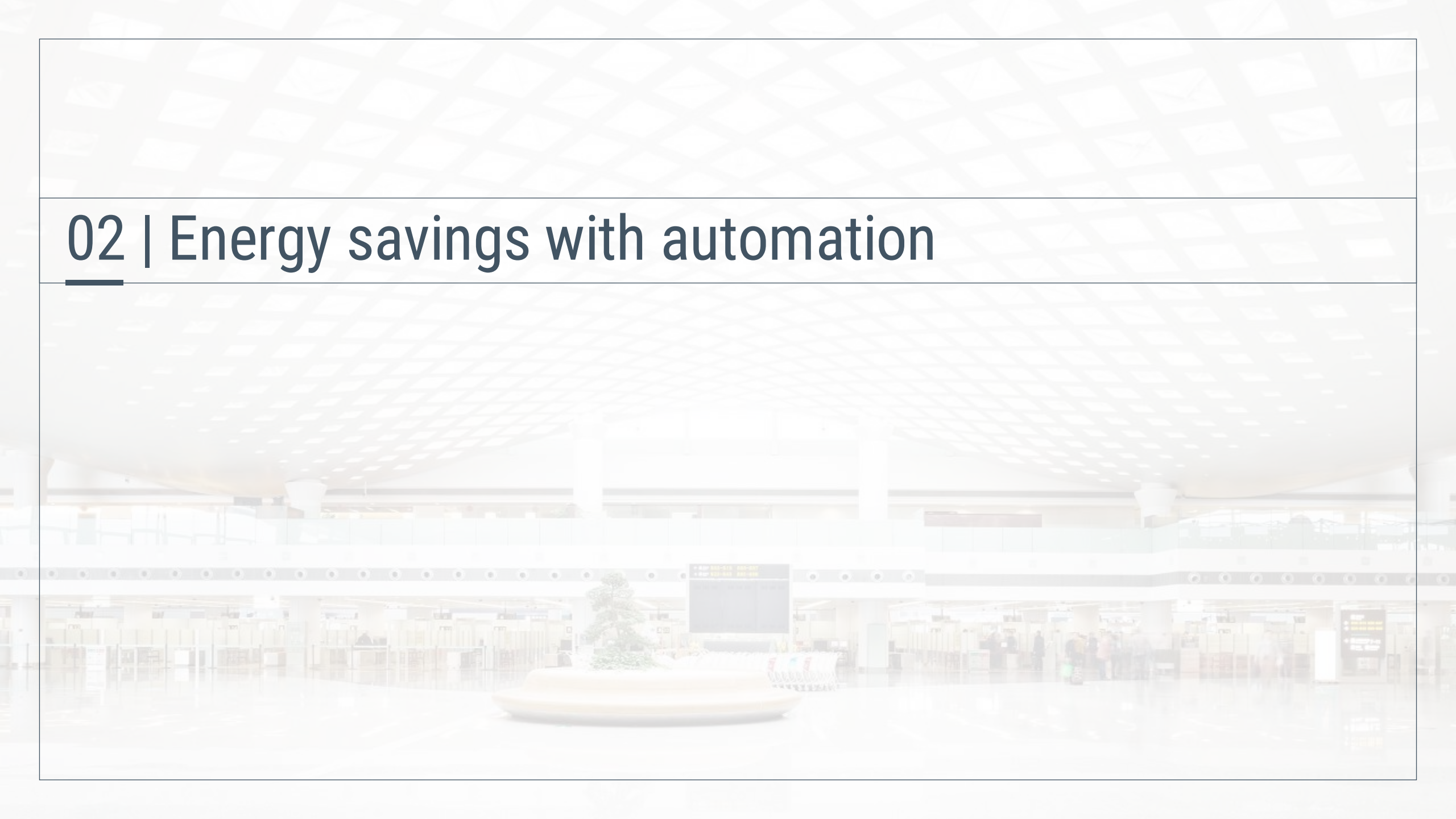
DALI-Multimaster

Summary

- Multiple control units (masters) possible on the same DALI line
- Each control unit can send commands → no fixed hierarchy
- Coordination via bus protocol → collisions are avoided
- Increased flexibility: e.g. buttons, sensors or gateways active simultaneously
- Status feedback from operating devices is read by all masters.
- Fault tolerance: Failure of a master does not affect control of the line.

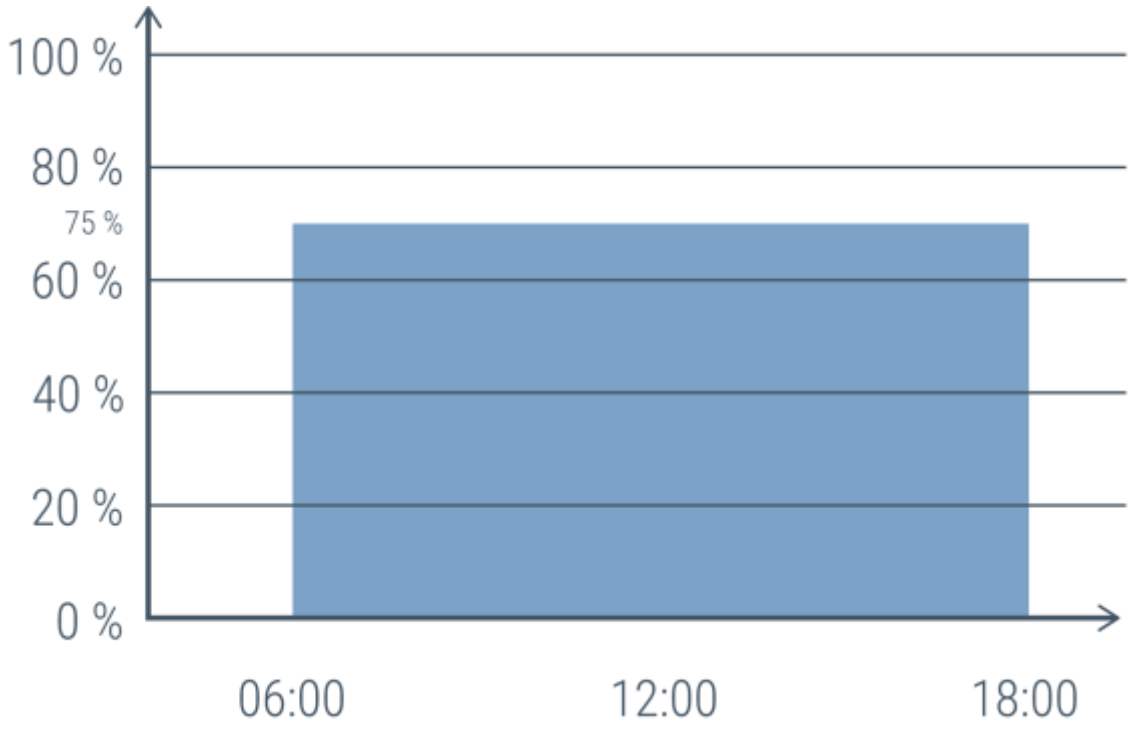
Do you have any questions about the basics of DALI?

02 | Energy savings with automation



From standard to demand-based lighting control: saving energy made easy

| Standard use: Manual switching on and off of the lighting



Luminaires and light sources

- Manual on/off switch

Typical scenario

- On in the morning / Off in the evening
- No consideration of presence and shading

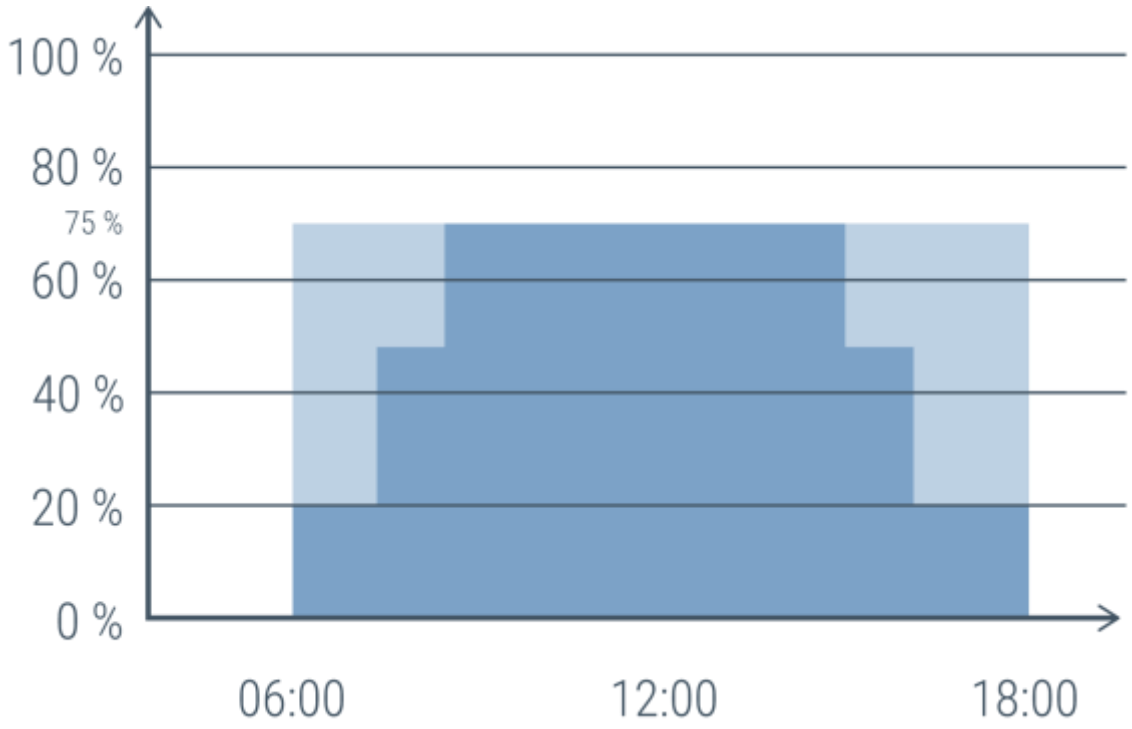
Conclusion

- The lighting is switched on for 12 hours without regulation.

Underlying asset: 100%

From standard to demand-based lighting control: saving energy made easy

| Simple automation: group and time-controlled switching of lighting



Luminaires and light sources

- Groups and time-controlled switching on/off

Typical scenario

- Rigid attitude
- No consideration of presence or daylight

Conclusion

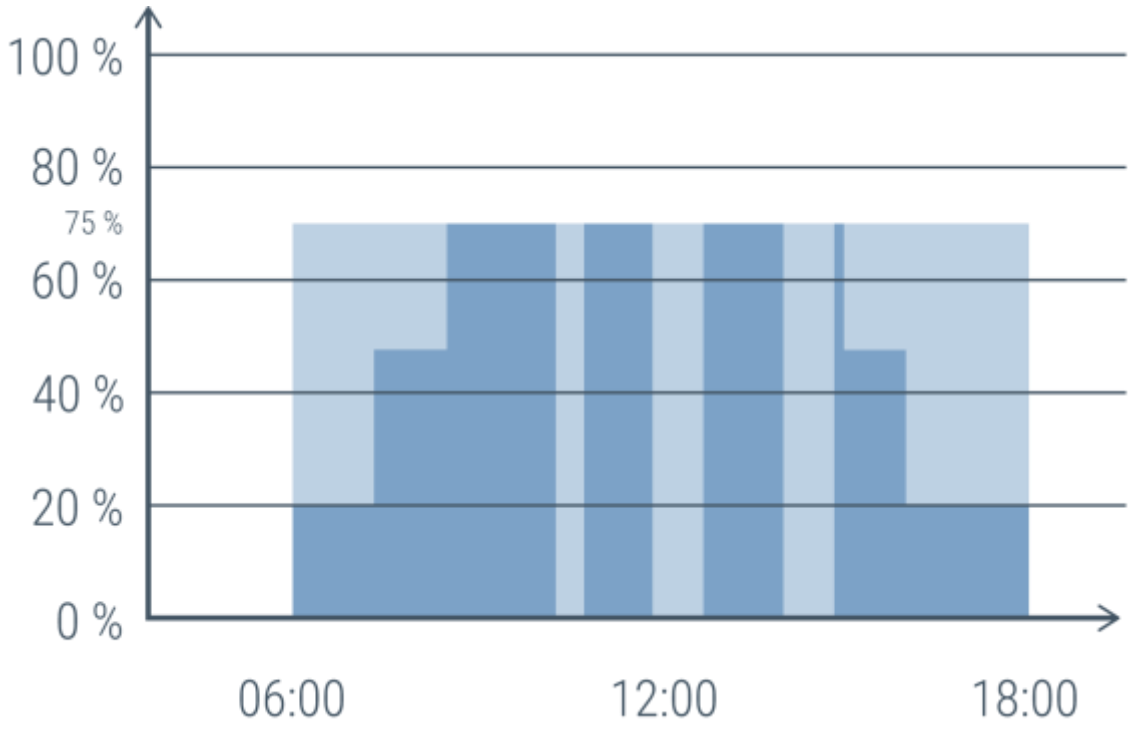
- The lighting is switched on and off in a rigid manner.

Savings

- ~ 30 % compared to base

From standard to demand-based lighting control: saving energy made easy

| Advanced automation: Presence-dependent control combined with time-controlled switching



Luminaires and light sources
- Presence-dependent and time-controlled switching on/off of groups

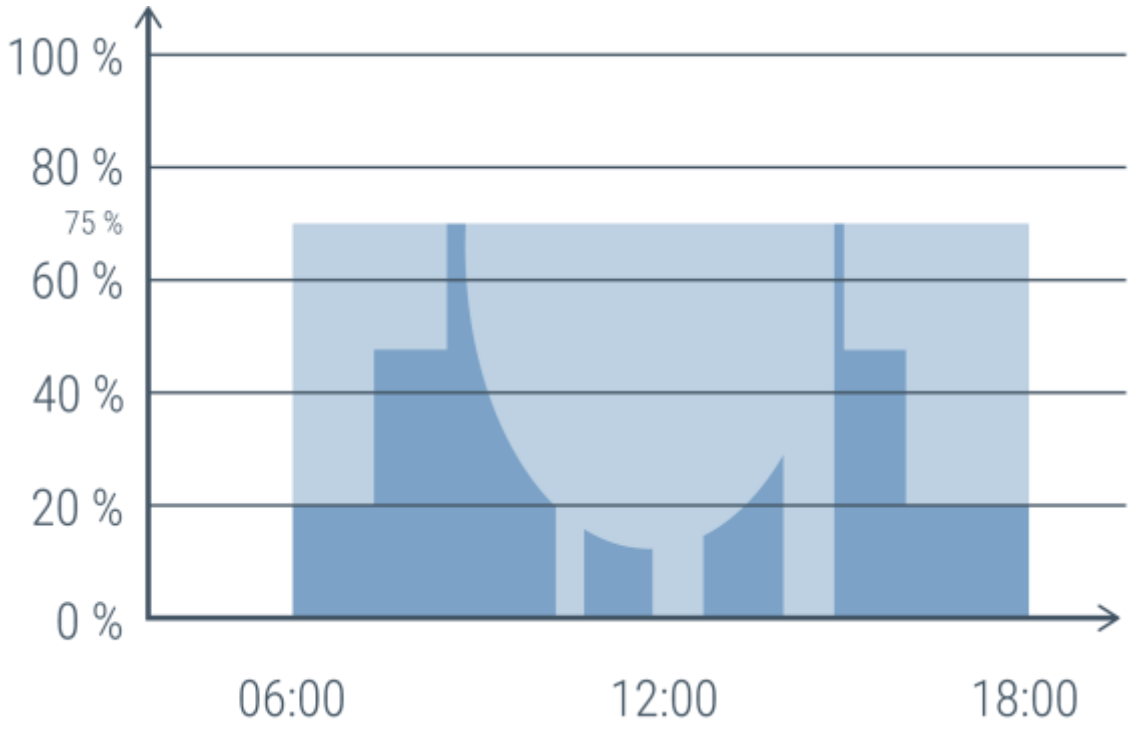
Typical scenario
- Rigid setting of times
- No consideration of daylight

Conclusion
- The lighting is controlled rigidly.

Savings
- ~ 50 % compared to base

From standard to demand-based lighting control: saving energy made easy

| Optimal automation: presence, time control and daylight-dependent control



Luminaires and light sources

– Presence-dependent, time-controlled & daylight-dependent control

Typical scenario

– Rigid setting of times

Conclusion

– The illuminance is regulated depending on daylight.

Savings

– ~ 65 % compared to base

Do you have any questions about energy saving or automation?

03 | Constant light control and lighting design

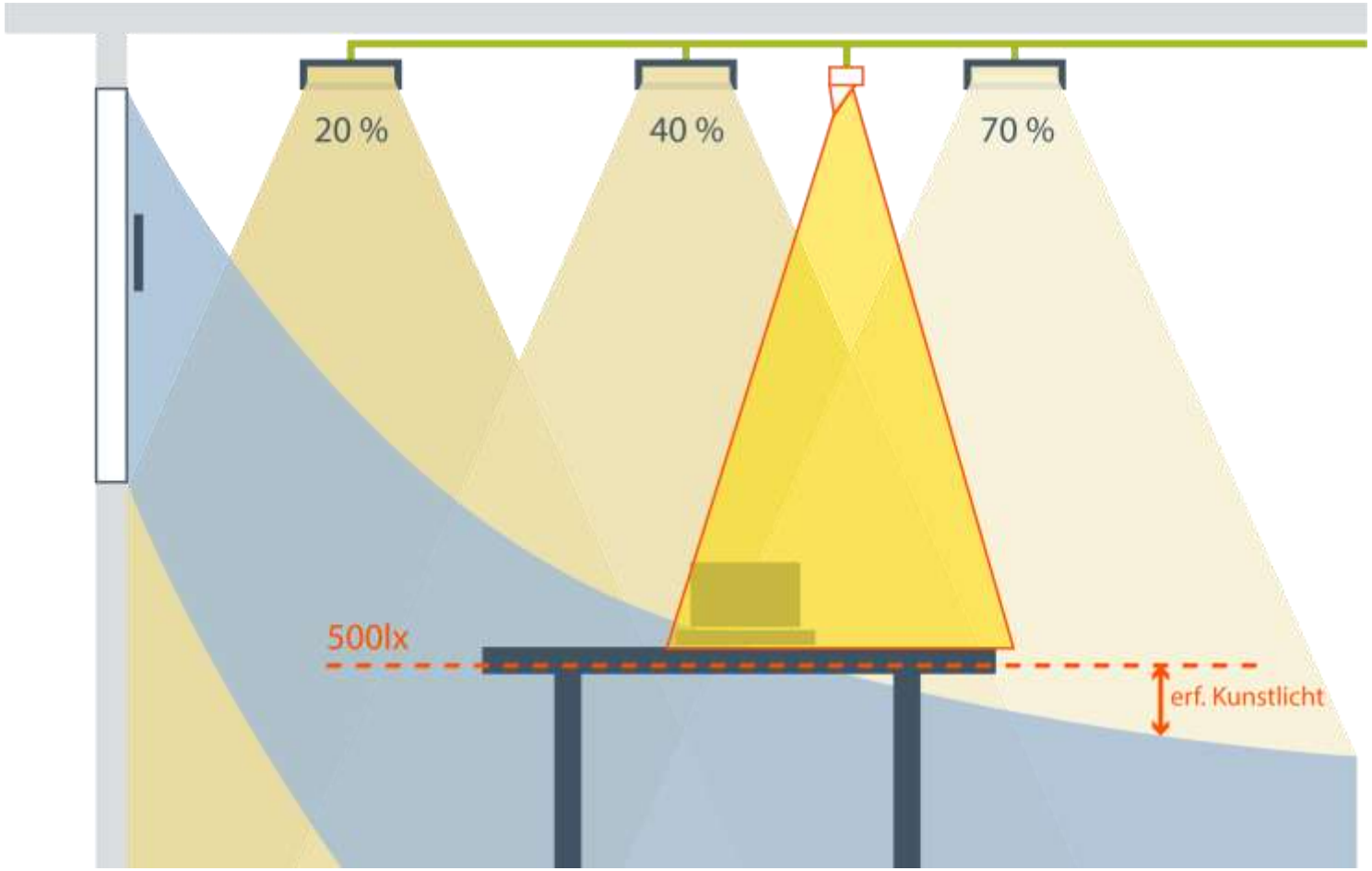
DALI - constant light control

| With brightness/presence detector

- Brightness is automatically adjusted to the room conditions, e.g. natural lighting/daylight
- Sensors measure brightness at the workplace or in the room
- Energy saving: lighting is only operated as brightly as necessary
- Optimally automated in combination with presence detectors

DALI - constant light control

| Example



DALI - constant light control

Important to note

- Room characteristics must not be changed without adjusting the settings (e.g. moving tables or reflective objects in the room).
- Do not mount the sensor directly on a natural light source/window.
- The surface beneath the sensor must be reflective.
- Dark surfaces reflect very little, so they are not suitable.
- Shield the sensor from daylight or external artificial light.

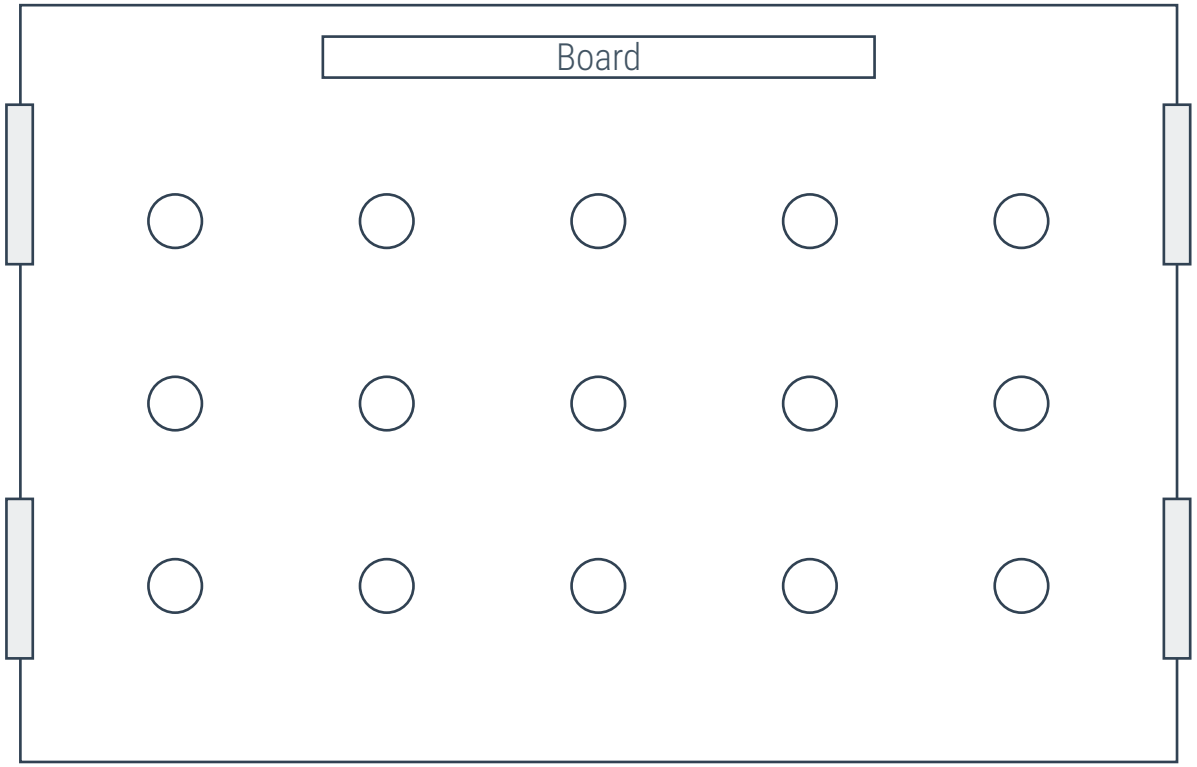
DALI – Lighting design

| Example

Quelle: https://www.saxonia-licht.de/led-beleuchtung-fuer-den-lebensmittelhandel/

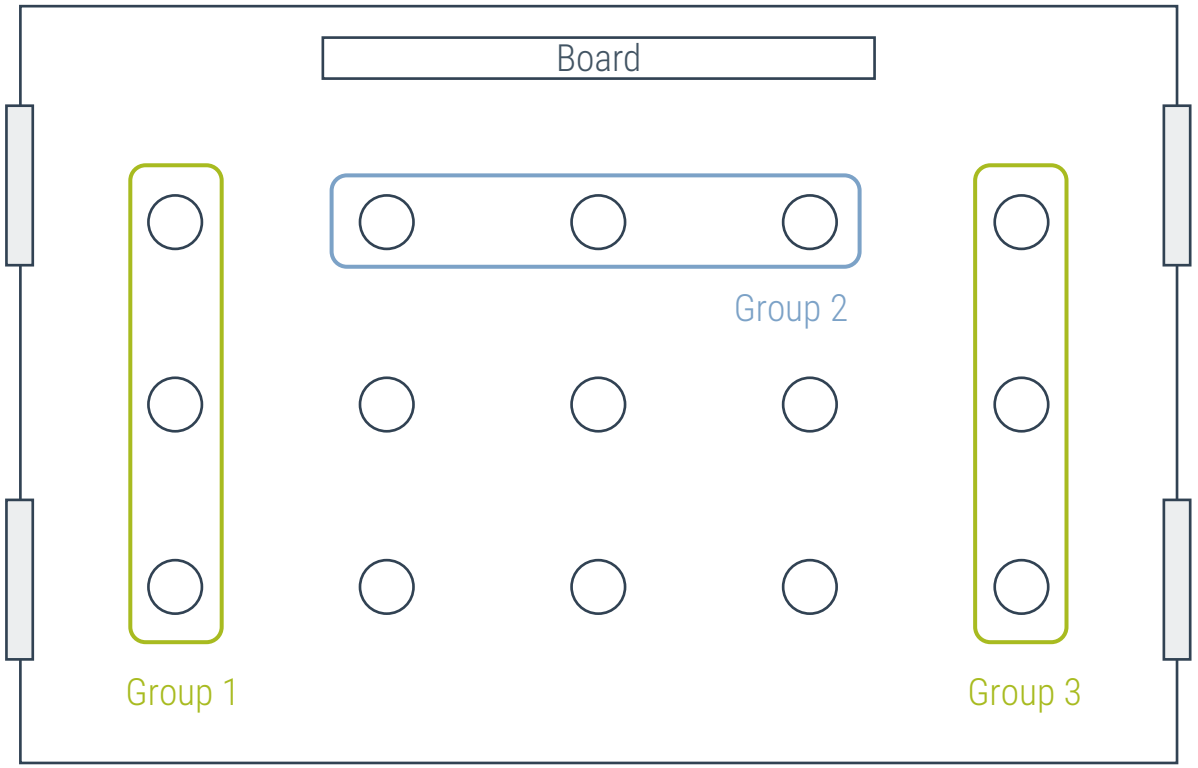
DALI – Lighting design

Overview



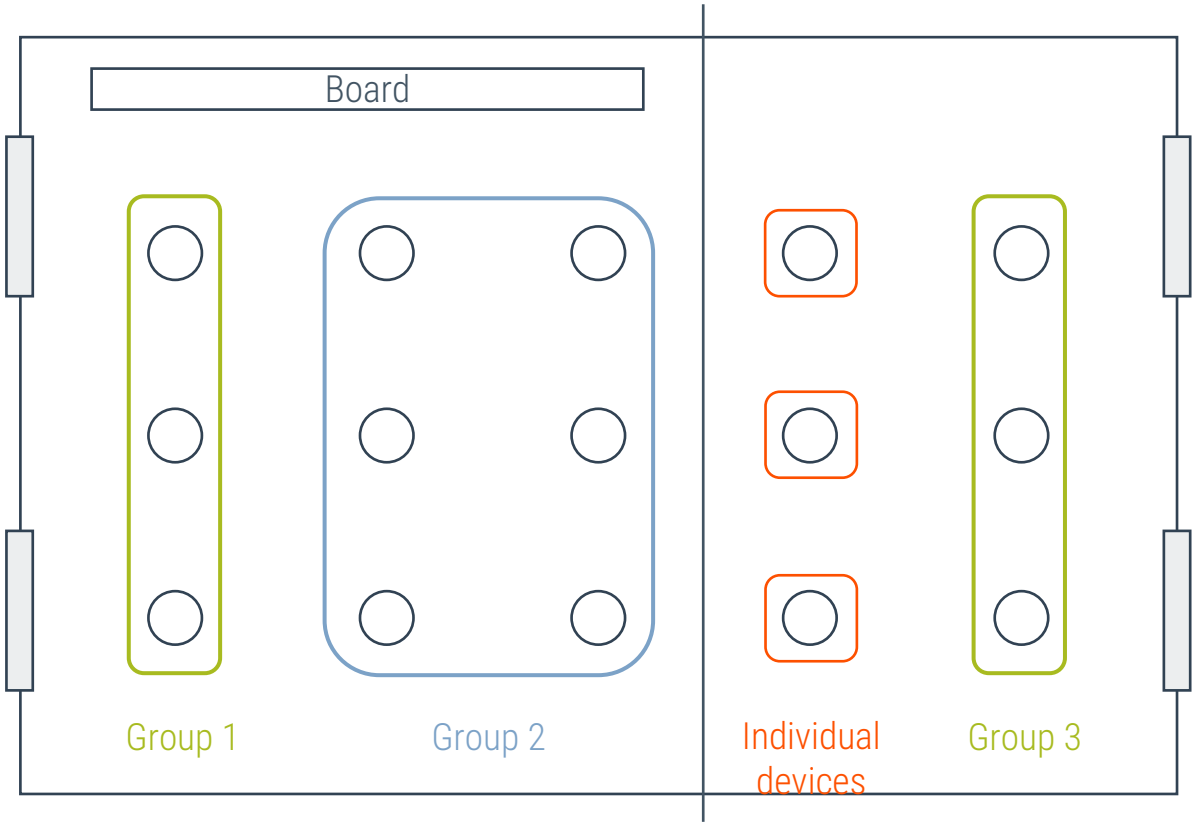
DALI - Lighting design

Create groups



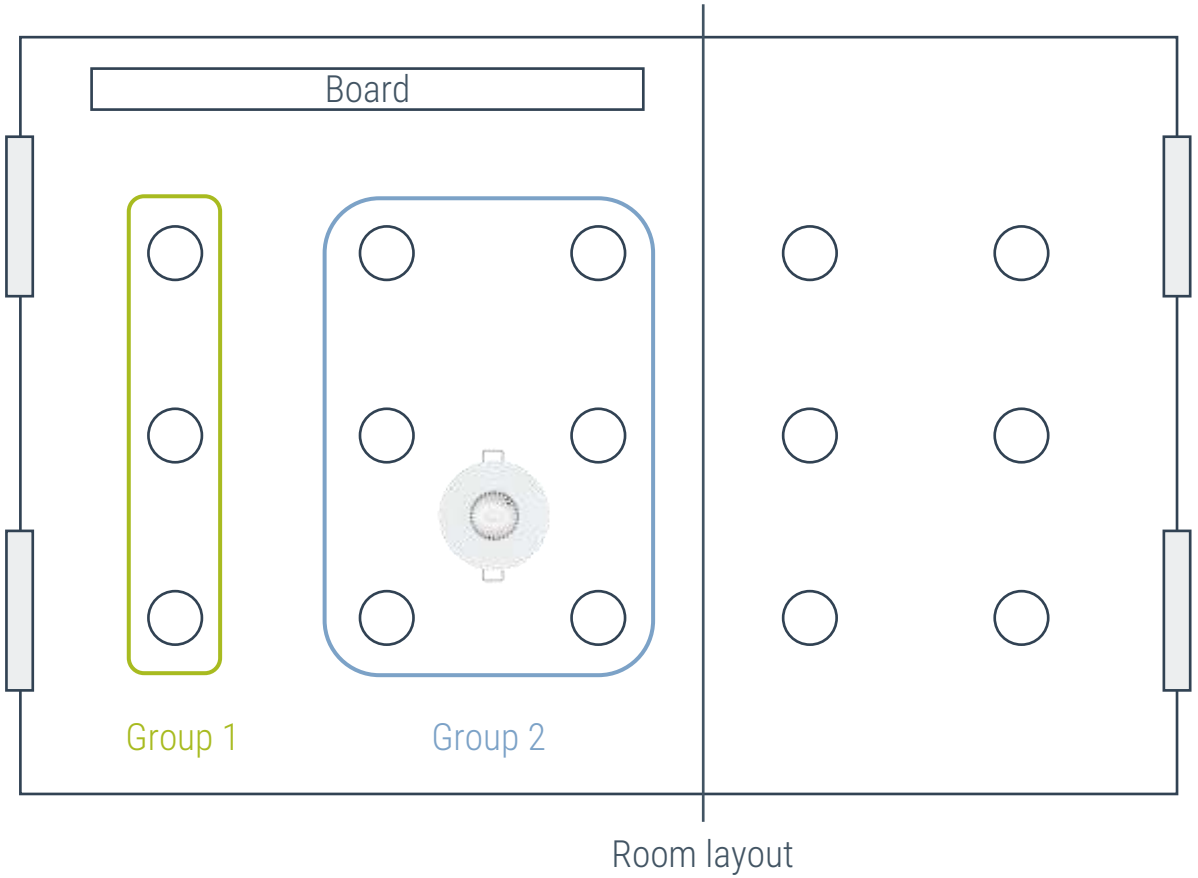
DALI - Lighting design

| Redistribution



DALI - Lighting design

| Integrate sensor



Do you have any questions about constant light control and lighting design?

04 | Product Overview

KNX-DALI-Interfaces

| Overview

KNX DALI L1 ind/gr/bc sec

- 1 DALI system connection
- 1 x 64 operating devices

KNX DALI L1 ind/gr/bc sec in the Online Shop ►

KNX DALI L2 ind/gr/bc sec

- 2 DALI system connections
- 2 x 64 operating devices

KNX DALI L2 ind/gr/bc sec in the Online Shop ►

KNX DALI L1/L2 ind/gr/bc sec

| KNX-DALI-Interfaces

- Interface between KNX bus and DALI lighting
- 1-2 DALI lines, each with up to 64 participants + 32 sensors
- Broadcast, groups, individual control
- DT8 support: colour temperature & colour control with limit values
- Device has KNX Secure

KNX DALI L1 ind/gr/bc sec in the Online Shop ▶

Intra-Sewi KNX TH-L-Pr

| Built-in presence, brightness and room climate sensor

- Presence detector/motion detector/light sensor
- Constant light control for optimum use of daylight
- Combined sensor with room temperature controller
- Award-winning design with glass surface
- For ceiling installation

Intra-Sewi KNX TH-L-Pr
in the Online Shop ▶

Do you have any questions about our products?

05 | Commissioning & Configuration

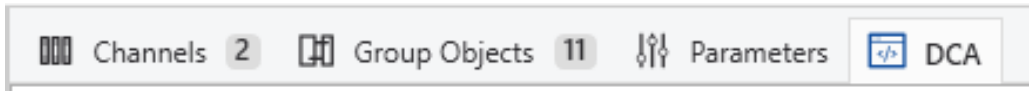
Commissioning

Procedure

Device Configuration App (DCA)

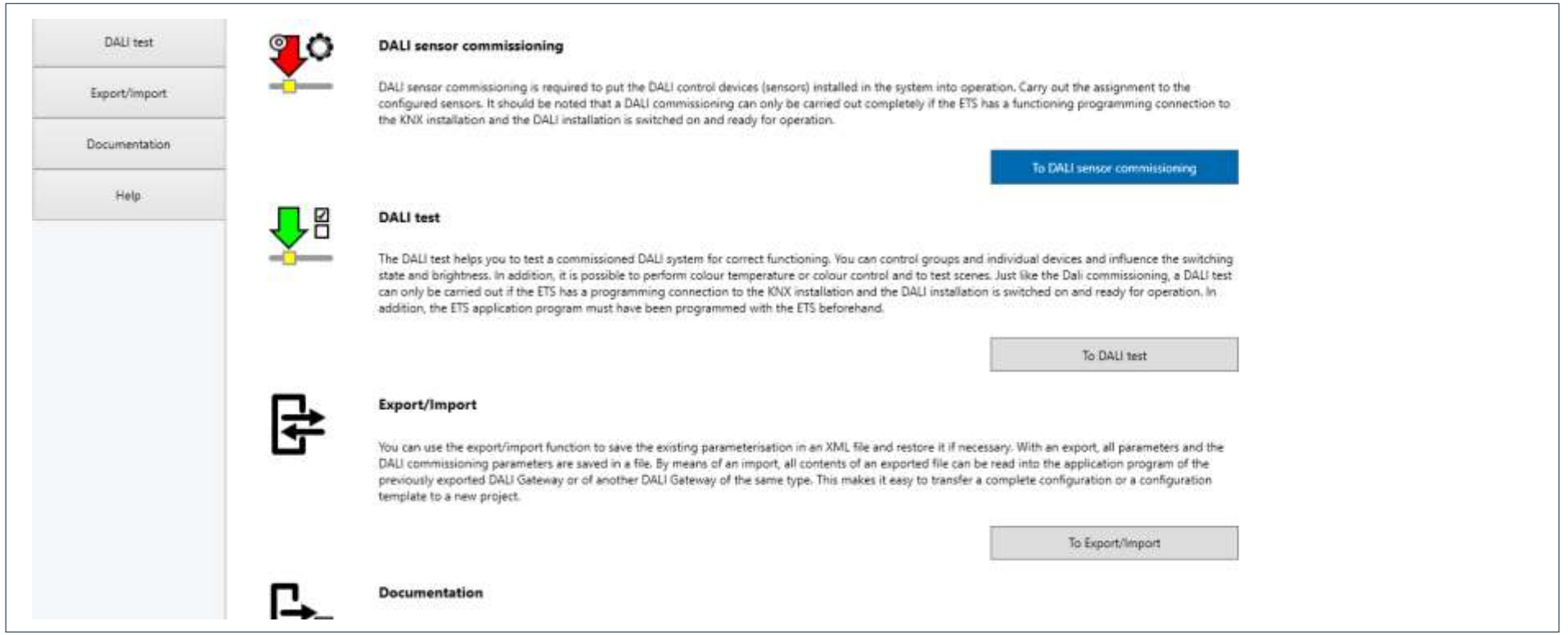
| DALI-setup

- Full DALI commissioning not possible with pure ETS5/6 application
- Additional tool required for DALI setup
- DCA directly available in ETS
- Broadcast function can also be used without DCA
- Easy configuration of DALI devices
- Monitoring & Diagnosis



Device Configuration App (DCA)

| DALI-setup



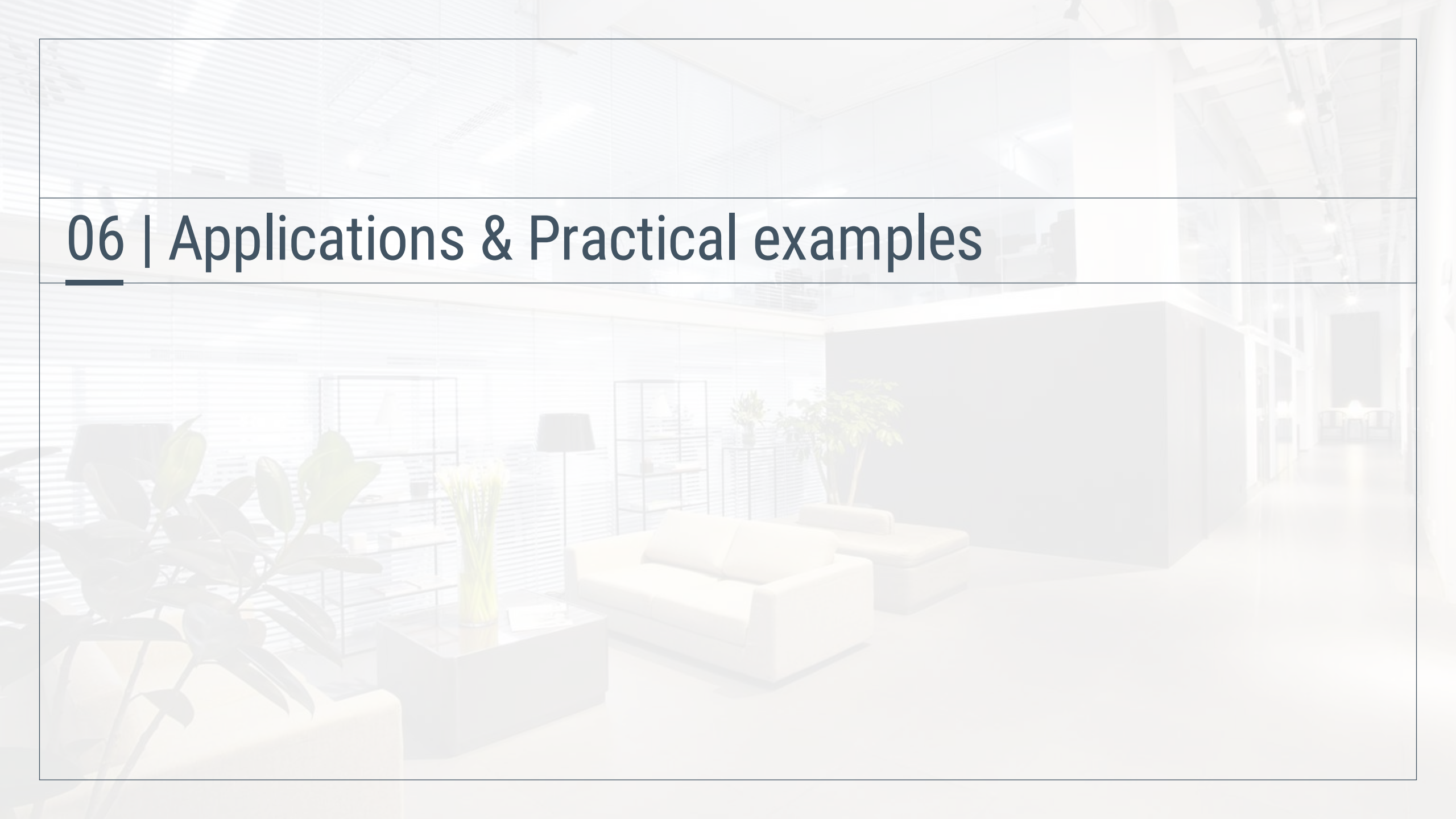
DCA/Application in ETS

| Parameter

We will now show you live how you can configure the device.

Do you have any questions about commissioning and configuration?

06 | Applications & Practical examples



Areas of application

| Overview

- Offices & Administration
- Educational Institutions
- Retail Trade
- Hotels & Catering
- Residential Buildings/Smart Homes
- Industry & Production
- Public buildings & Outdoor areas

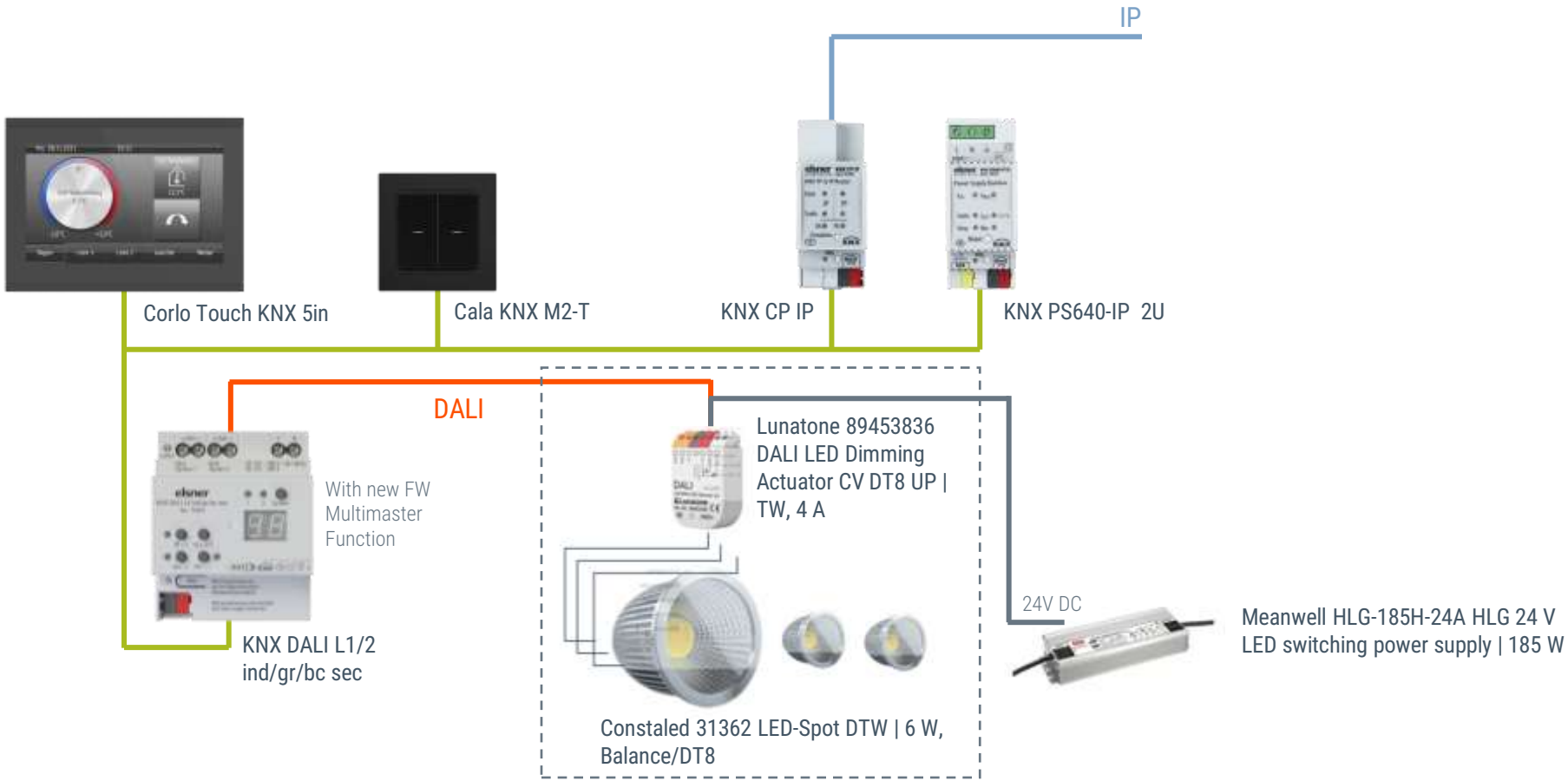
Status message on KNX bus

| Practical advantages

- Lamp failure can be reported via KNX bus
- Caretaker/technician receives the information directly on their visualisation
- No individual testing of each lamp necessary
- Time savings & improved planning possible

KNX-DALI lighting control

| TW Application



DCA/Application in ETS

| Parameter

We will now show you live how you can configure the device.

Do you have any questions about the applications?

07 | Troubleshooting in DALI

Error case status output

| In Elsner KNX DALI L1/L2 sec

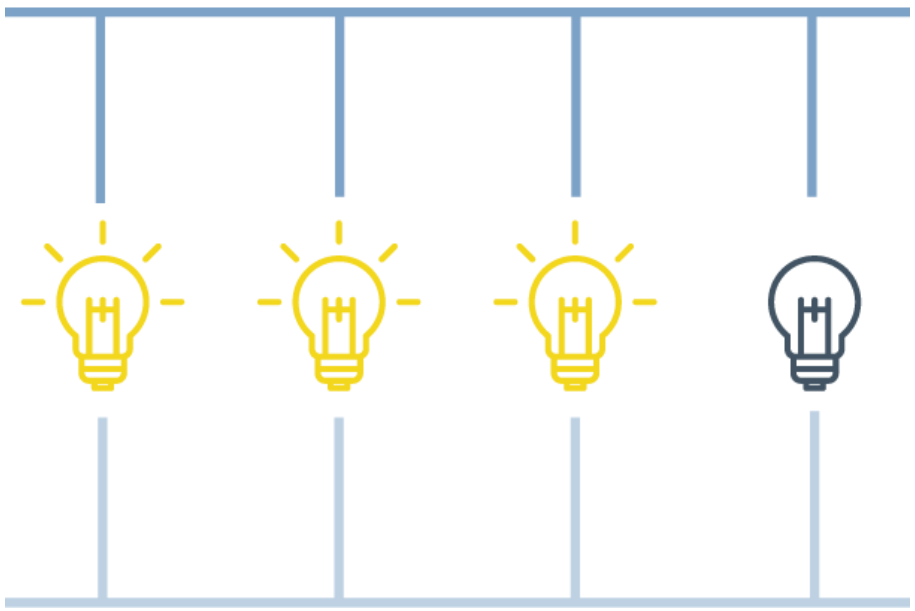
- DALI system error
- Errors per DALI operating device
- Errors per DALI group / individual device

Error case 1

Problem
A light remains off despite control commands.

Possible causes:

- Supply voltage missing
- Incorrect parameterisation
- CG defective
- Light defective

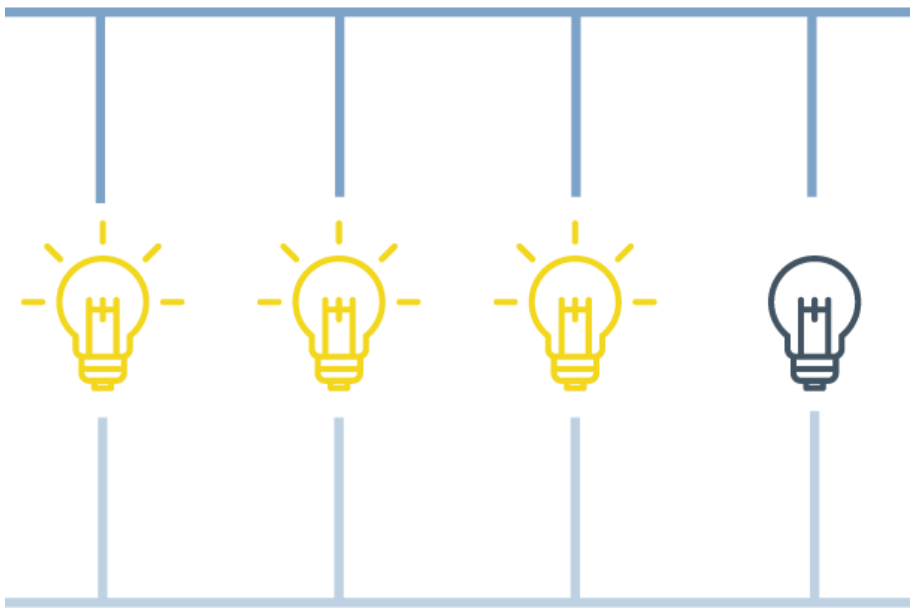


Error case 2

Problem
The light is permanently switched on at 100% and does not respond.

Possible causes:

- DALI bus interruption
- Excessive voltage drop/voltage too low
- Power supply/fuse defective
- Incorrect parameterisation

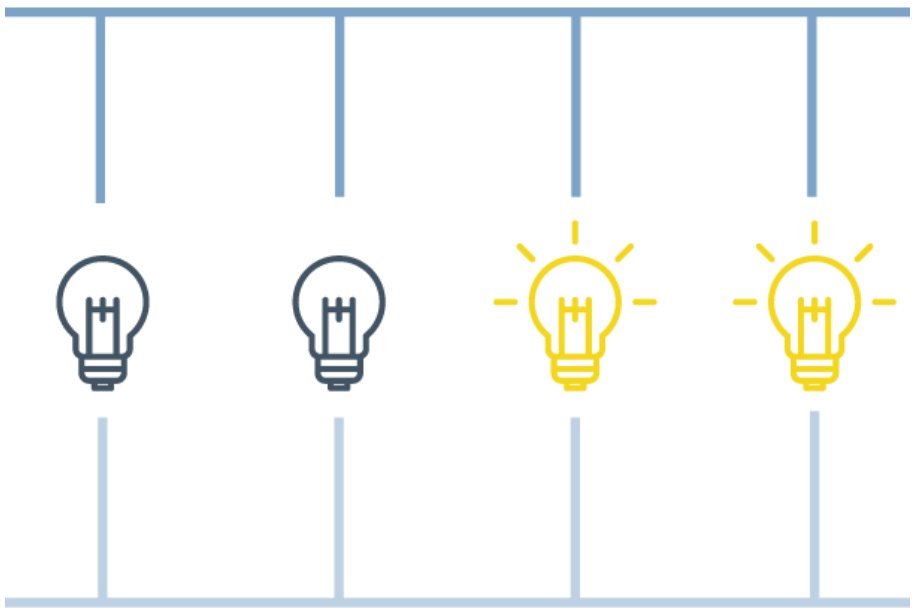


Error case 3

Problem
The lamp cannot be controlled individually.

Possible causes:

- Devices have the same address
- Can only occur if already addressed CG are subsequently added to the DALI line or, for example, the CG is exchanged across DALI line boundaries.

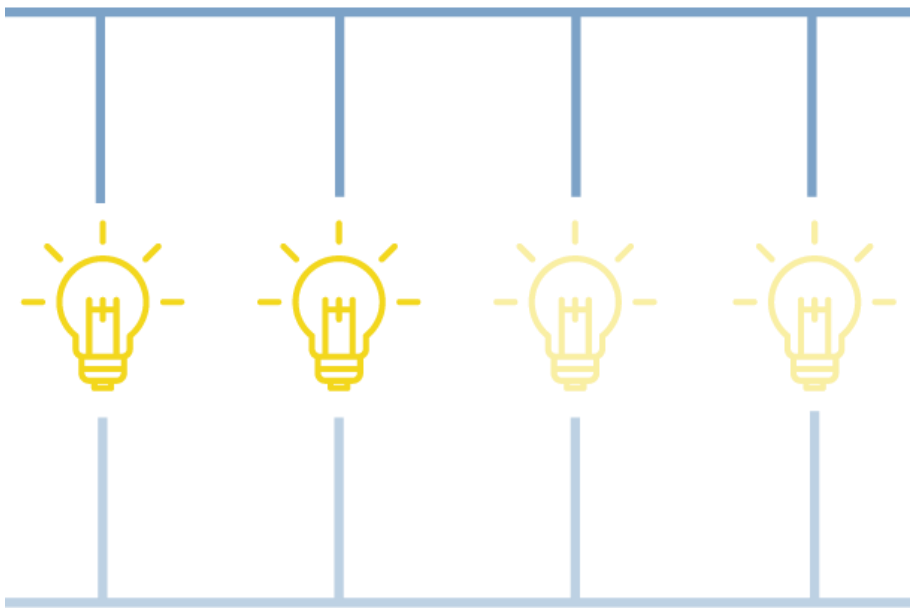


Error case 4

Problem
Some lamps remain at 50% during high dimming.

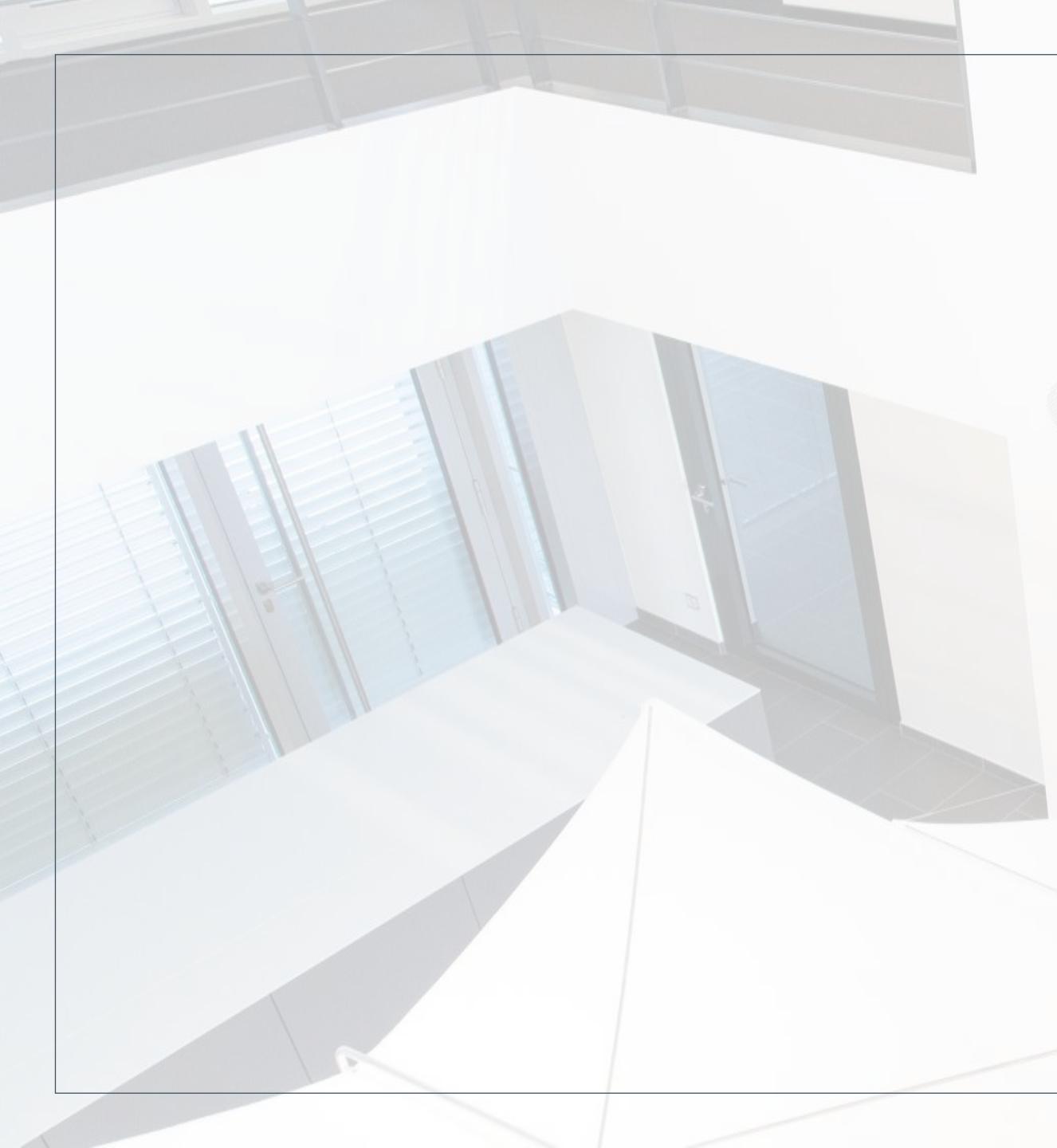
Possible causes:

– The "Max Level" parameter has not been configured correctly.



Do you have any questions about troubleshooting in DALI?

WISHES, SUGGESTIONS & FEEDBACK



Further webinars and
recordings can be found here

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