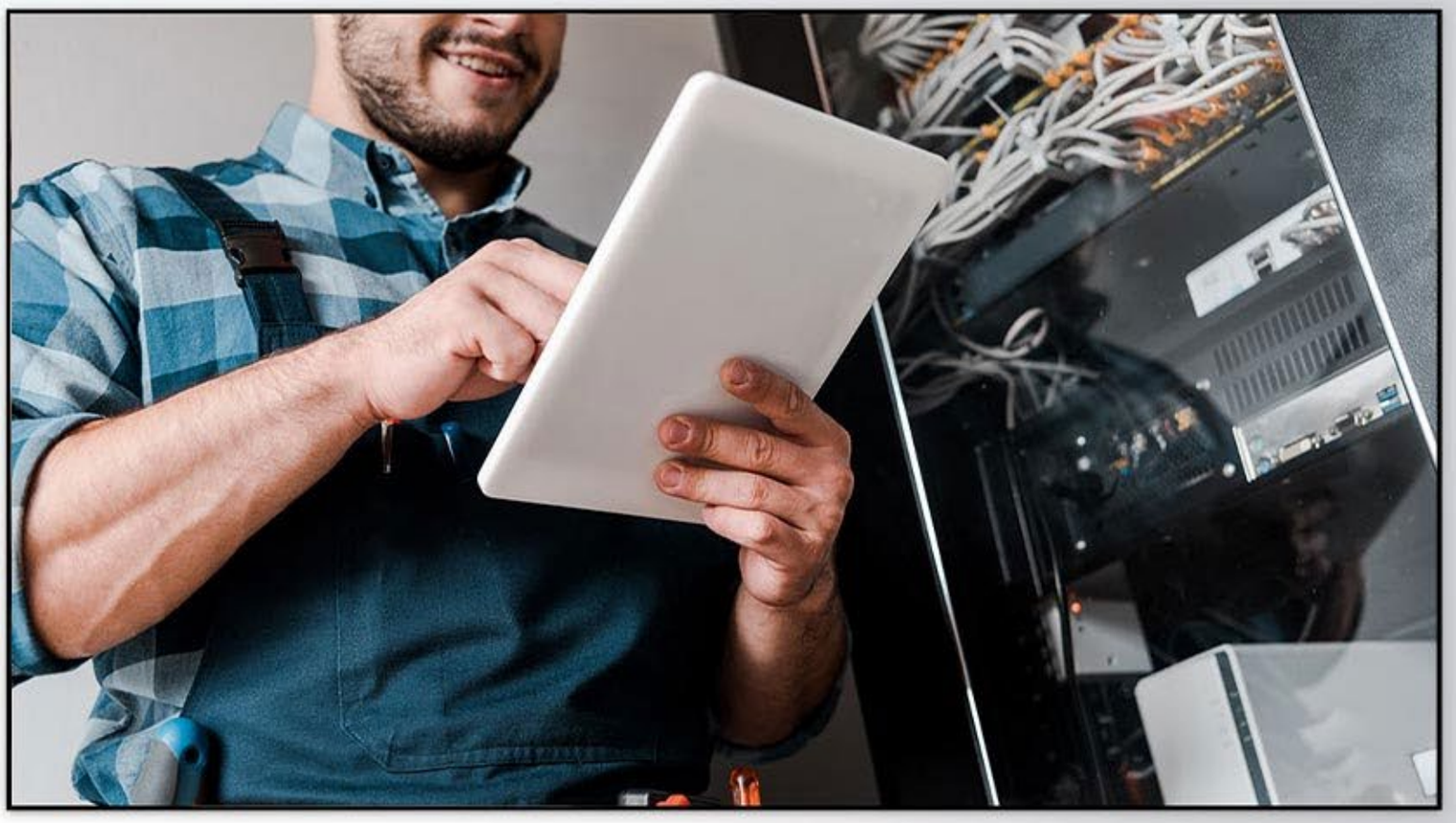


Tradesman update

AGENDA

Tradesman update (50min)

- Eco-Design Directive
- Retrofit as a good alternative ?
- New requirements of EN 12464-1
- Practical tips for the quick conversion of a lighting system
- Use of light management systems

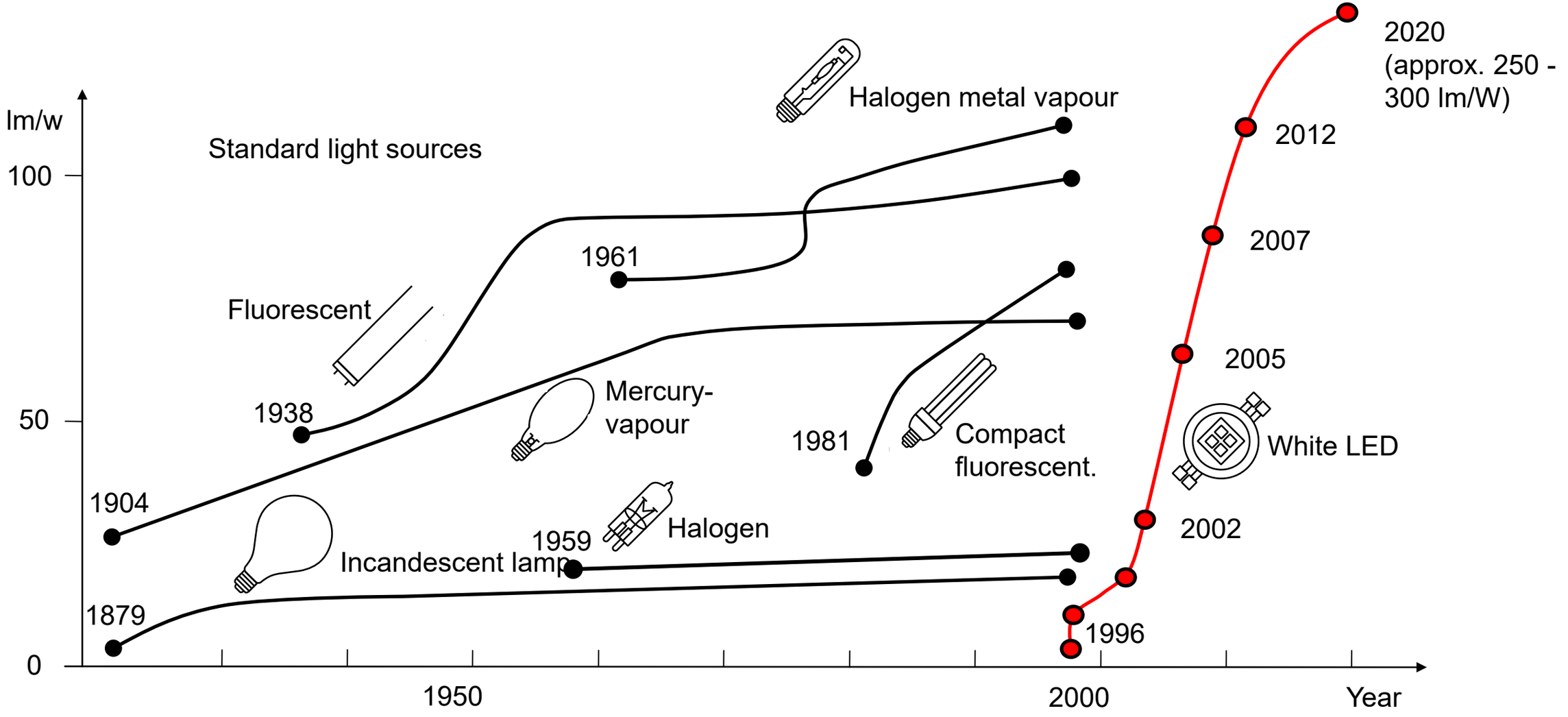
ECO DESIGN GUIDELINE

How it all began..

How it all began..

Lamp type	Year	Comment
Incandescent lamp	2018 (start 2009)	All of them!
Halogen lamps	2018	R7s or G9 bases, which are still per d with EEK.
Mercury vapour lamps	2015	In particular HQL lamps

LUMINOUS EFFICIENCIES - HISTORY




The lamp must have:
Rated luminous flux:
60 - 80,000 lm
CRI:
greater than "0"
12500 K
1940 K
Source:Document 32019R2020

PHASING OUT OF LIGHT SOURCES

	01.09.2021	
Compact fluorescent lamps (with integrated ballast / E14, E27 etc.)		
Mains-voltage halogen lamps linear (R7s > 2,700 lm = approx. 140 W)		
Low-voltage halogen lamps (with reflector / GU4, GU5.3 etc.)		

Source:
licht.de

PHASING OUT OF LIGHT SOURCES

	01.09.2021	01.09.2023
Compact fluorescent lamps (with integrated ballast / E14, E27 etc.)		
Mains-voltage halogen lamps linear (R7s > 2,700 lm = approx. 140 W)		
Low-voltage halogen lamps (with reflector / GU4, GU5.3 etc.)		
Linear fluorescent lamps T8 (600 mm, 1,200 mm, 1,500 mm)		
Mains-voltage halogen lamps (G9)		
Low-voltage halogen lamps (G4, GY6.35)		

Source:
licht.de

PHASING OUT OF LIGHT SOURCES

	01.09.2021	01.09.2023
Compact fluorescent lamps (with integrated ballast / E14, E27 etc.)		
Mains-voltage halogen lamps linear (R7s > 2,700 lm = approx. 140 W)		
Low-voltage halogen lamps (with reflector / GU4, GU5.3 etc.)		
Linear fluorescent lamps T8 (600 mm, 1,200 mm, 1,500 mm)		
Mains-voltage halogen lamps (G9)		
Low-voltage halogen lamps (G4, GY6.35)		
Compact fluorescent lamps (without integrated ballast)		
Mains-voltage halogen lamps (R7s ≤ 2,700 lm)		
Linear fluorescent lamp T5		
Circular fluorescent lamps		
High-pressure discharge lamps		

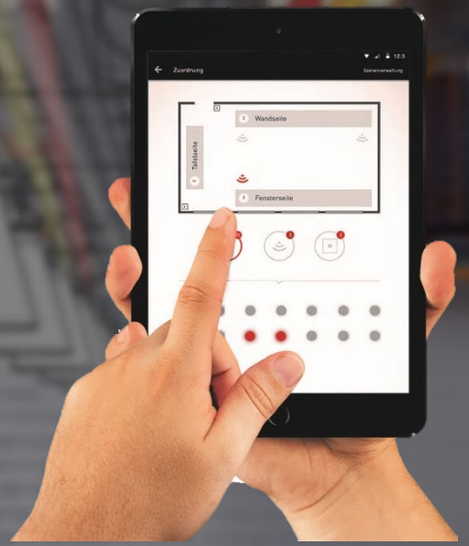
Source:
licht.de

OUR RECOMMENDATION

Step 1

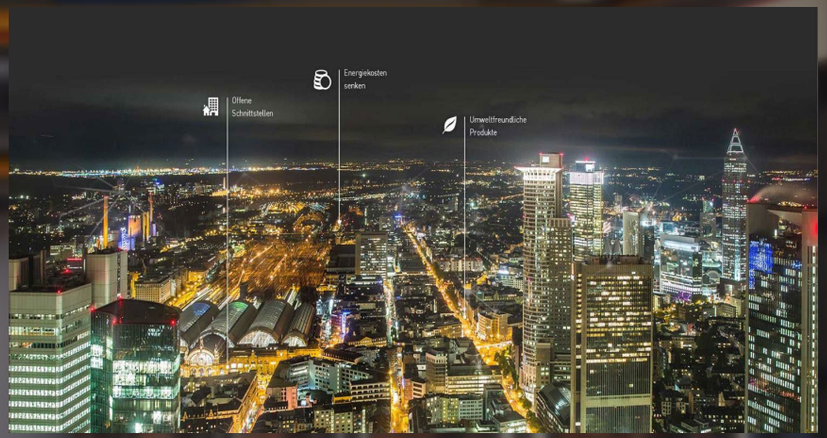
Keep an eye on bans and systematically replace old systems with LED technology

Step 2



Use
Control technologies

Step 3



Prepare for "digital" applications of tomorrow

Smart City meets Smart Lighting

Is renovation worthwhile?

The retrofit lamp as an alternative?

PROBLEMS AND DANGERS

- Lighting
  - No comparable luminous fluxes
  - No comparable radiation angles
  - Frequently visible stroboscopic effects and risk of flicker

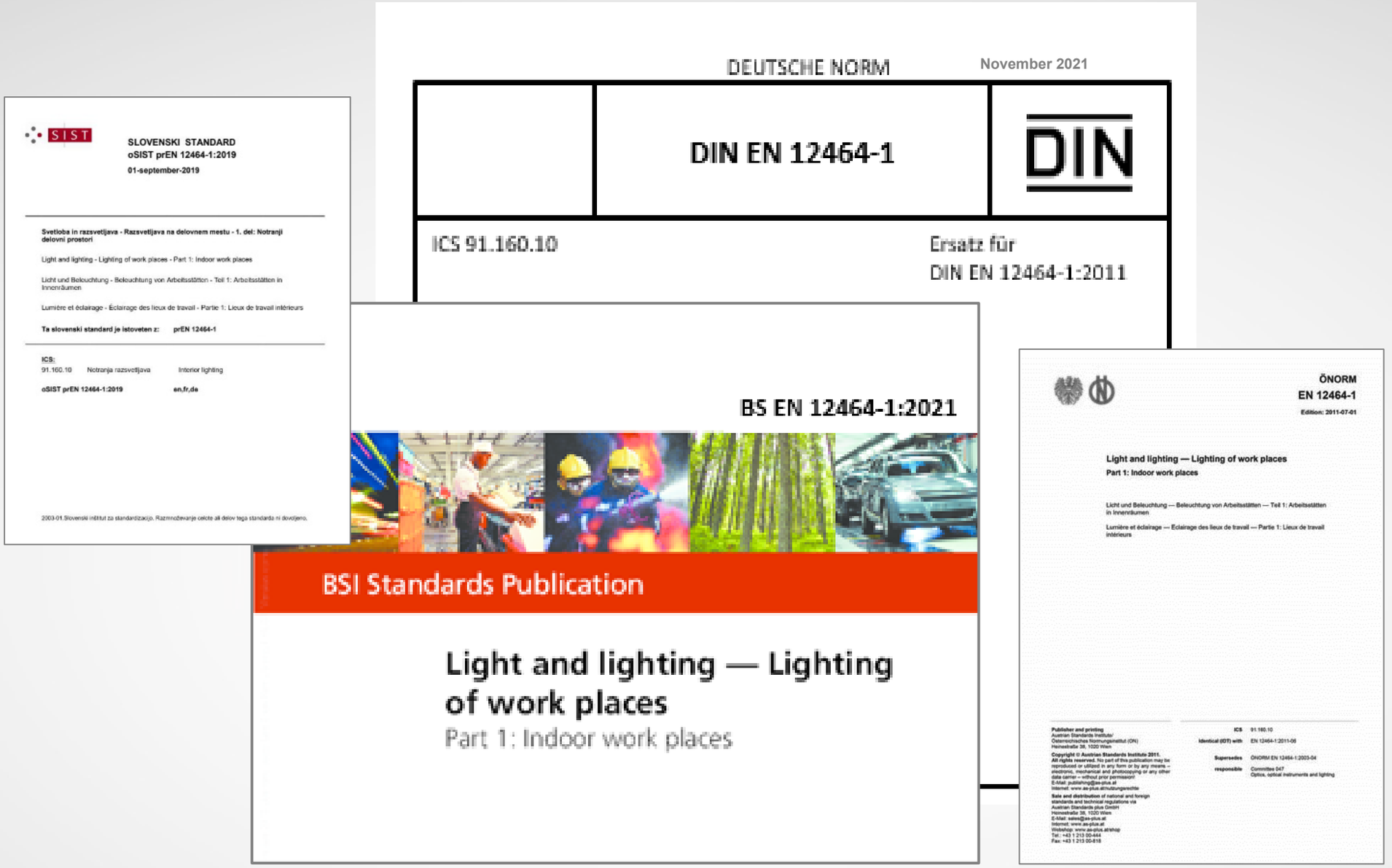
- Electrotechnical
  - Possible higher reactive current components
  - Often only intended for certain VG
  - Technical modification of the luminaire - No fault-free function guaranteed
    - VDE, ENEC, EMC
  - No warranty claims

- Economical
  - No subsidies, as LED lights are much more efficient and therefore more sustainable.
  - It's an investment in a legacy asset!

MORE INFORMATION ON OUR UPDATE PORTAL!

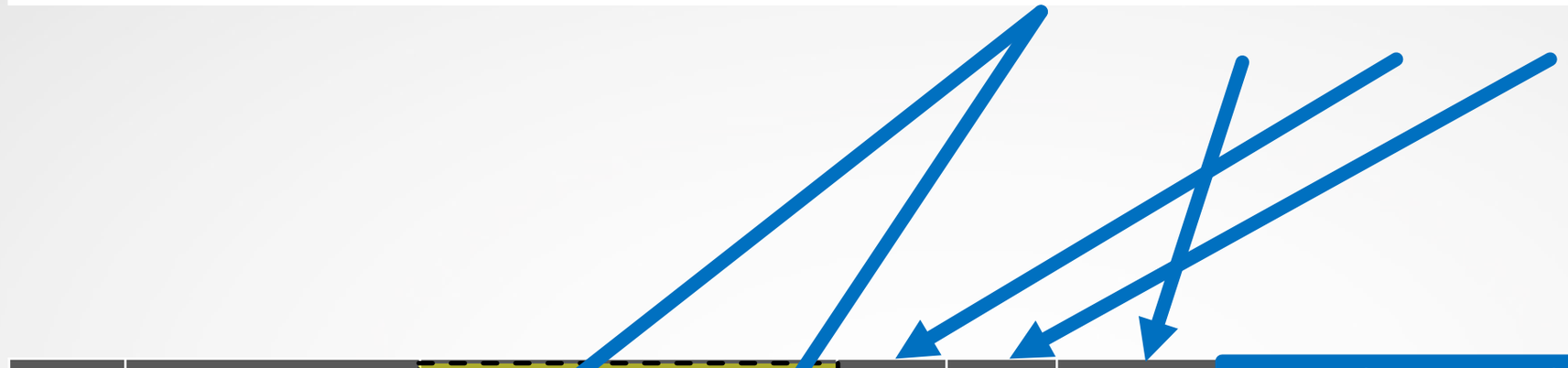
Light Planning – the latest guidance

REVISION EN 12464-1 LIGHTING OF WORKPLACES



THE EXTENDED TABLE

Ref. No.	Type of indoor space (area), visual task area or activity area	$\bar{E}_m$ lx	UGR	U_o	R_a	Specific conditions



Ref. No.	Task area	$\bar{E}_m$ lx		U_o	R_a	R_{UGL}	$\bar{E}_{m,z}$ lx	$\bar{E}_{m,Wand}$ lx	$\bar{E}_{m,Decke}$ lx	Special requirements
		required	modified				$U_o \geq 0{,}10$			

ILLUMINANCE LEVELS - PERMANENTLY OCCUPIED WORKPLACES

Ref. No.	Task area	$\bar{E}_m$		U_o	R_a	R_{UGL}	$\bar{E}_{m,z}$	$\bar{E}_{m,Wand}$	$\bar{E}_{m,Decke}$	Special requirements
		required	modified				$U_o \geq 0{,}10$			
33.2	Write, type, read, data-processing	500	1000	0,60	80	19	150	150	100	VDU work, see 5.9 Room brightness, see 6.7 and Annex B Lighting should be controllable, see 6.2.4. For smaller cubicle offices, the wall requirement applies to the wall in the main viewing direction. For other walls, a lower requirement of at least 75 lx can be accepted.

Scale of illuminance:

5 - 7,5 - 10 - 15 - 20 - 30 - 50 - 75 - 100 - 150 - 200 - 300 - 500 - 750 - 1 000 - 1 500 - 2 000 - 3 000 - 5 000 - 7 500 - 10 000 lx

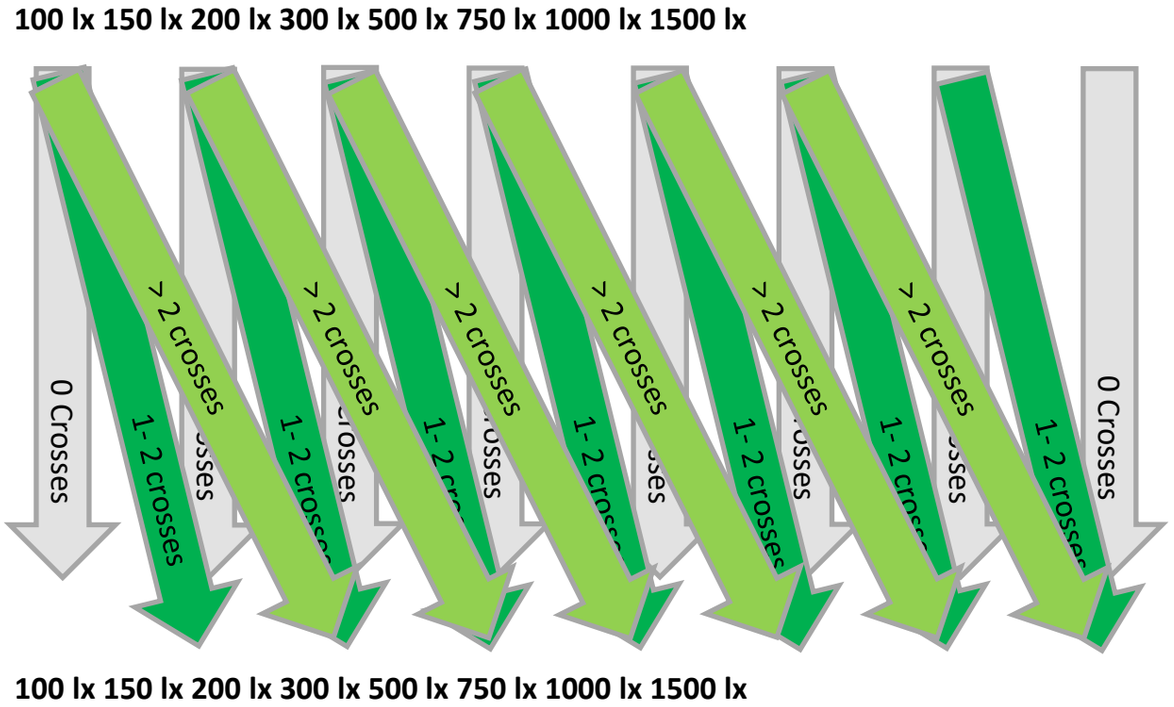
2 levels of illuminance

WHEN IS THE INCREASE?

- ○ Visual work is crucial
- ✗ Troubleshooting is costly
- ○ Accuracy, higher productivity or increased concentration of great importance
- ○ Task details unusually small or of low contrast
- ○ Task of unusually long duration
- ✗ The task has low daylight
- ✗ The user's visual acuity is below the normal value

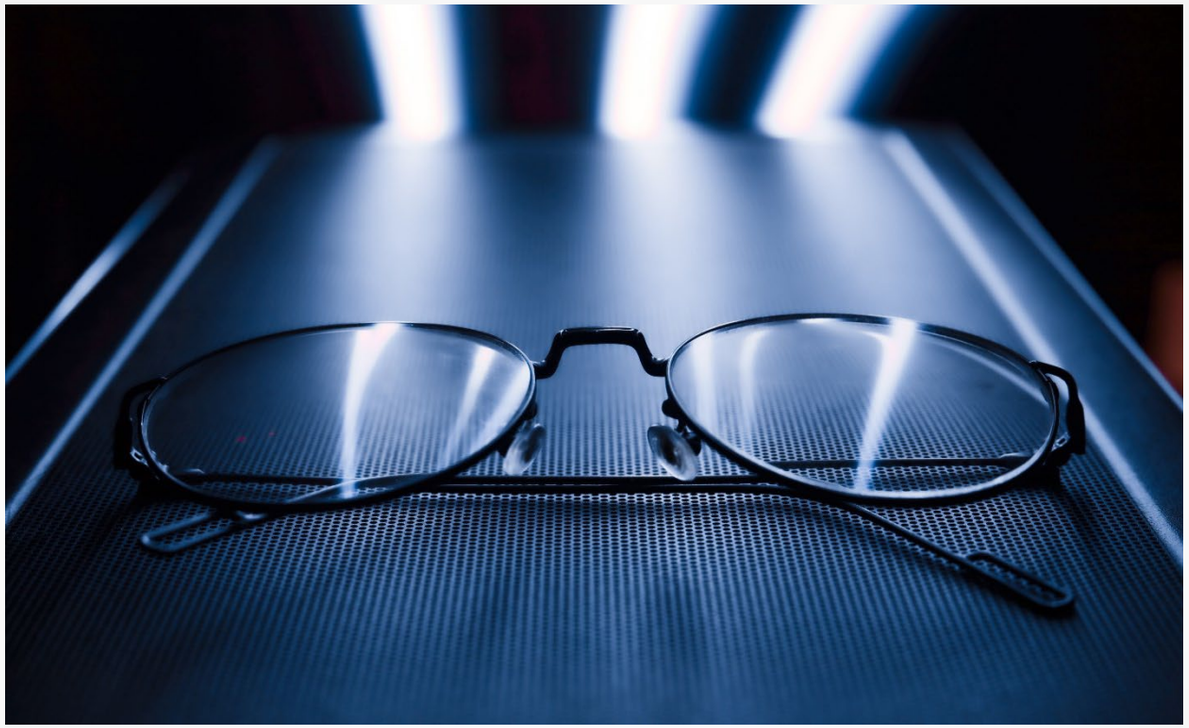
Additional recommendation

- ○ > 30 years - ≤ 50 years
- ○ > 50 years

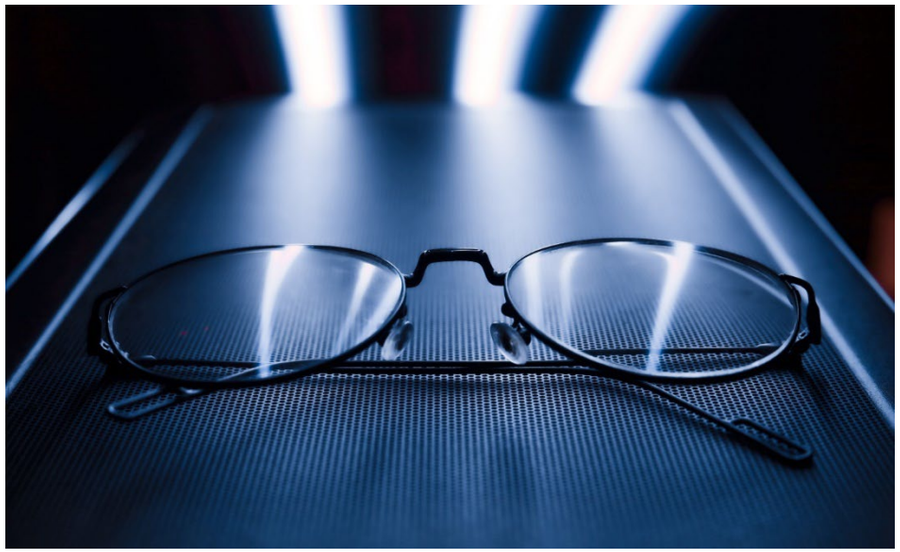


MAINTANED VALUE OF THE ILLUMINANCE
WHEN IS IT ***INCREASED?***

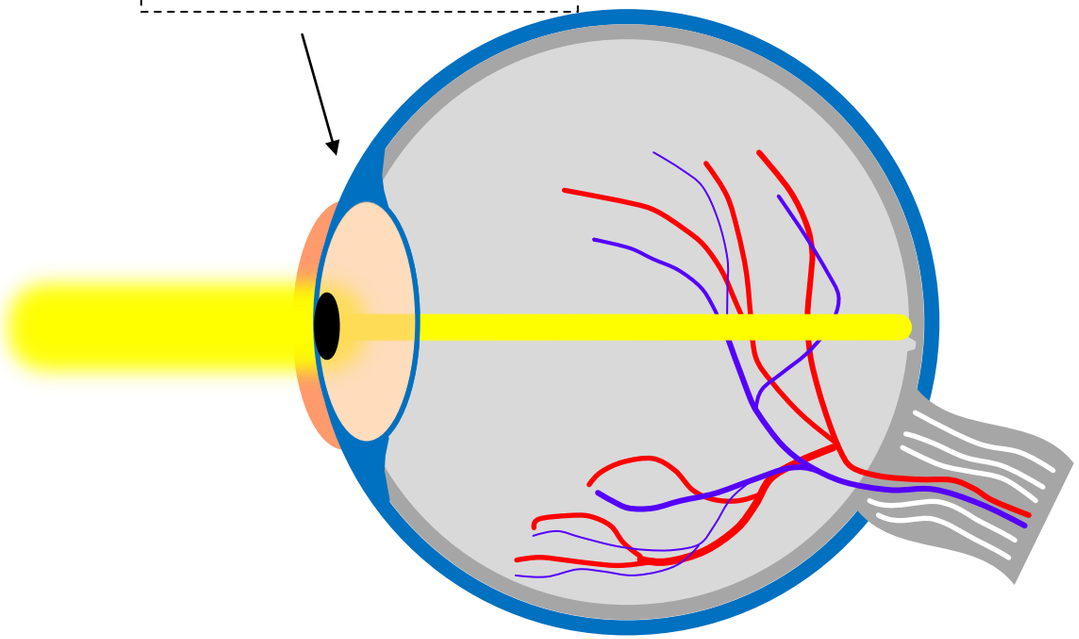
The visual ability of the user
is below the normal value



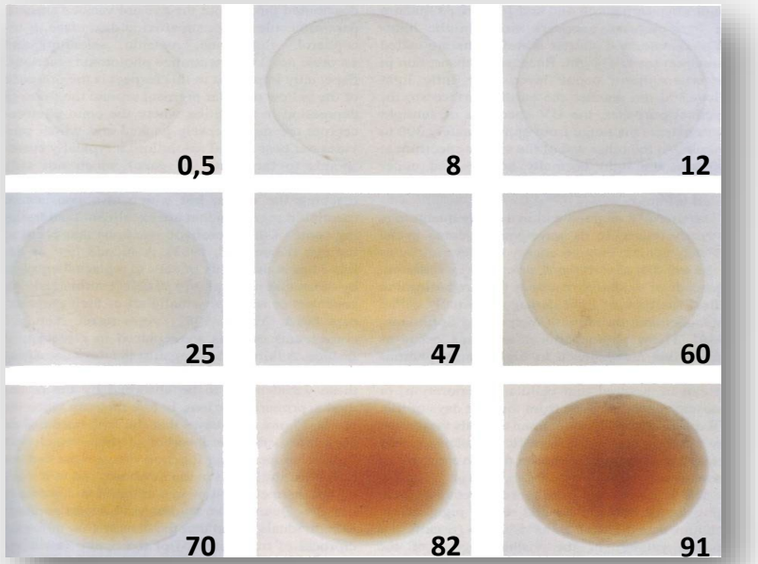
The visual ability of the user
is below the normal value



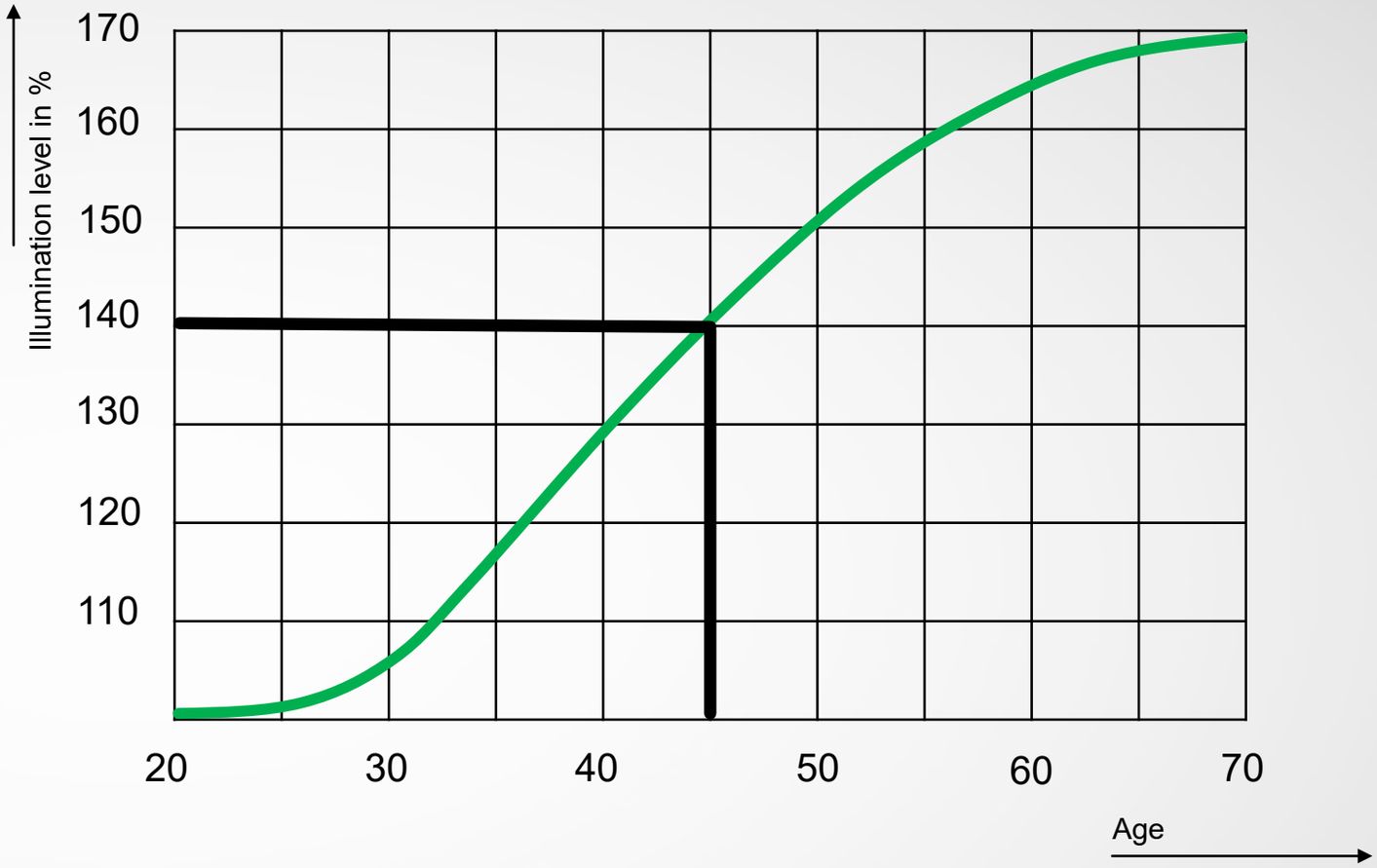
Occurrence of lens opacity
in the course of life



LIGHT AND LIGHTING IN DEMOGRAPHIC CHANGE



Ageing effect on the eye



MODIFIED ILLUMINANCE

Direct lighting
Recessed luminaires

Direct/indirect lighting
Pendant light

Direct/indirect lighting
Desk light

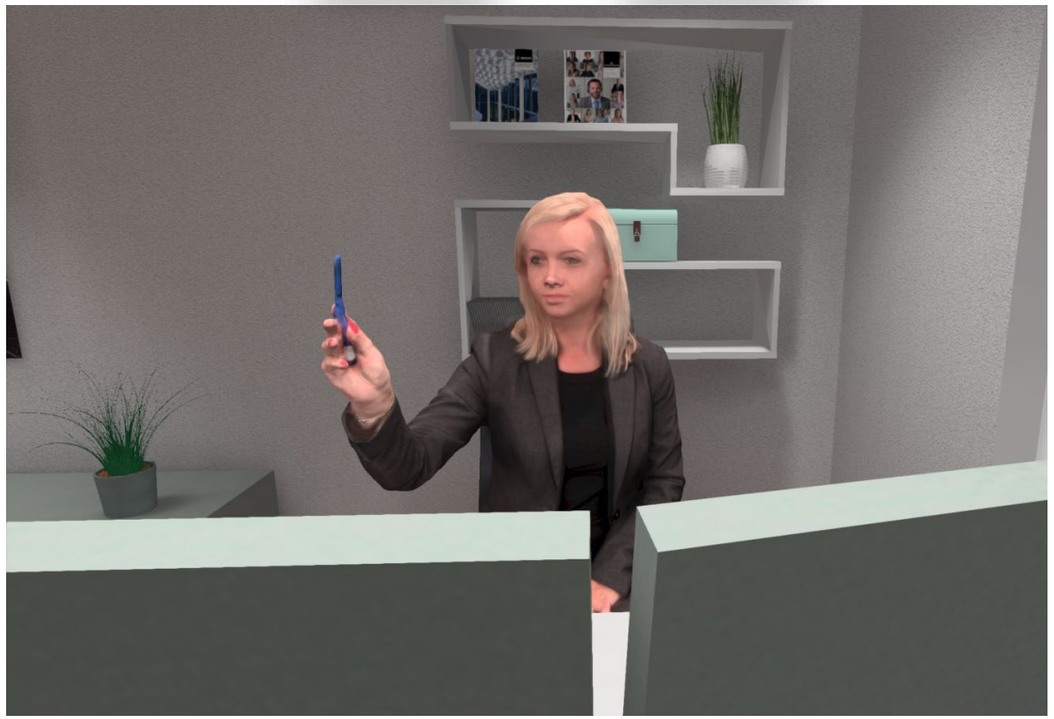
- The fastest and easiest way is to plan the lighting systems to the "modified" value and use a light management system to set the required brightness on site.
    - suitable for each user, but also covers every activity.
- Alternatively, it is also possible to plan a basic brightness of 500 lx and increase the level on the work surface with suitable table or floor luminaires, for another 500 lx.

CYLINDRICAL ILLUMINANCE REQUIREMENTS

Ref. No.	Task area	$\bar{E}_m$		U_o	R_a	R_{UGL}	$\bar{E}_{m,z}$	$\bar{E}_{m,Wand}$	$\bar{E}_{m,Decke}$	Special requirements
		required	modified					$U_o \geq 0{,}10$		

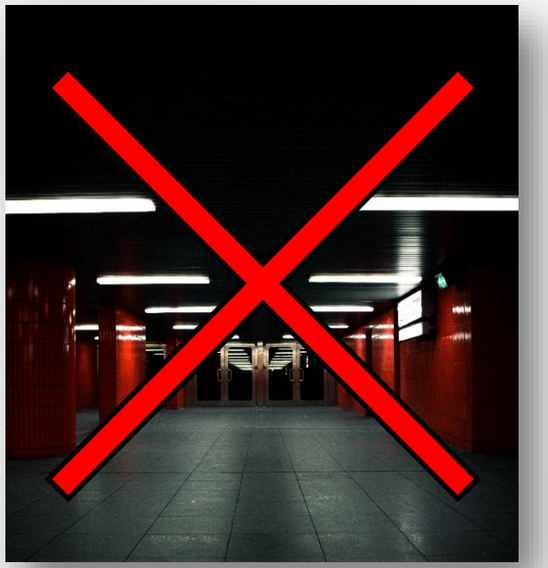
CYLINDRICAL ILLUMINANCE REQUIREMENTS

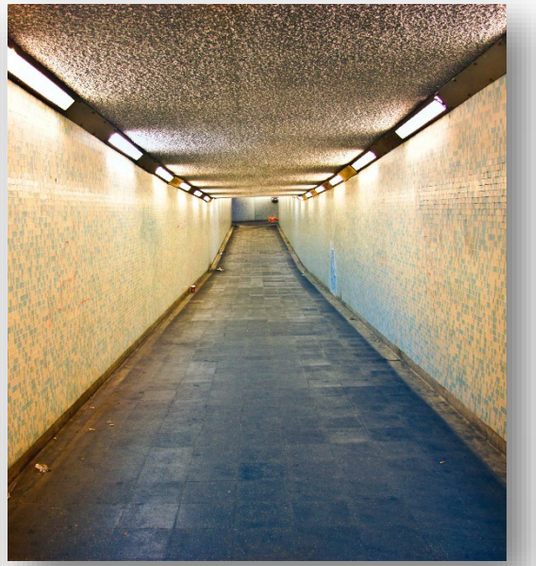
+



BRIGHTNESS DISTRIBUTION IN THE ROOM - A CHARACTERISTIC OF "LIGHTING QUALITY

Ref. No.	Task area	$\bar{E}_m$		U_o	R_a	R_{UGL}	$\bar{E}_{m,z}$ lx	$\bar{E}_{m,wall}$ lx	$\bar{E}_{m,ceiling}$ lx	Special requirements
		required	modified				$U_o \geq 0{,}10$			

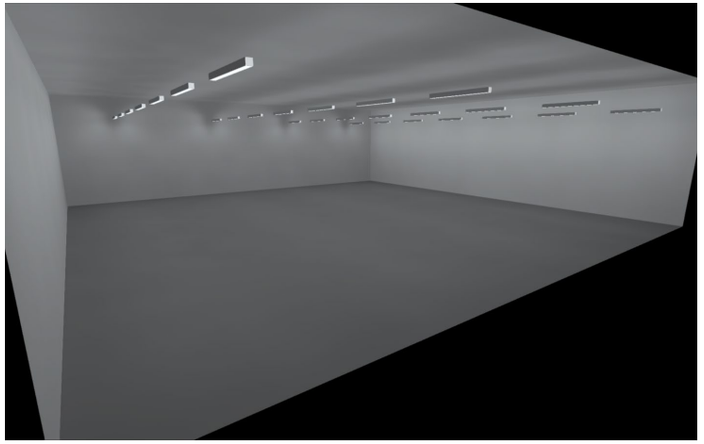




How am I supposed to make this all work?

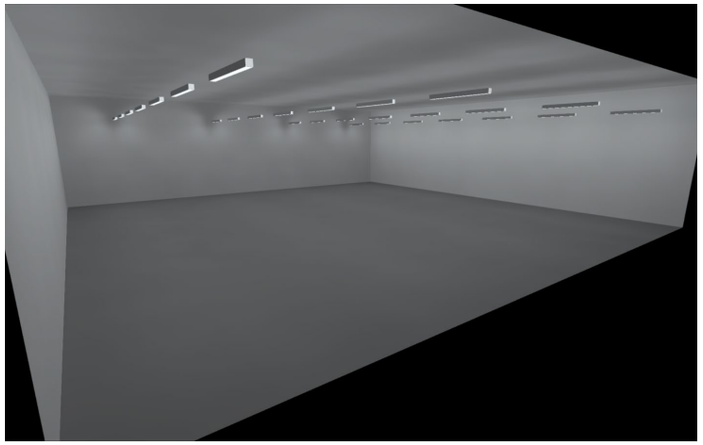
Comparison of OLD and NEW system

INVENTORY OF THE OLD SYSTEM DISPATCH AND PACKING ROOM



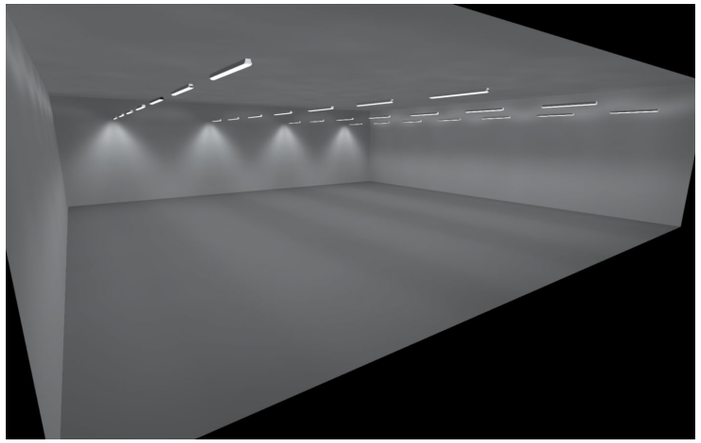
	Oleveon T8
Number	28 pcs.
Power	2x 58 W
Luminous flux	10.000 lm
Em	313 lx
Uo	0,63

INVENTORY OF THE OLD SYSTEM DISPATCH AND PACKING ROOM



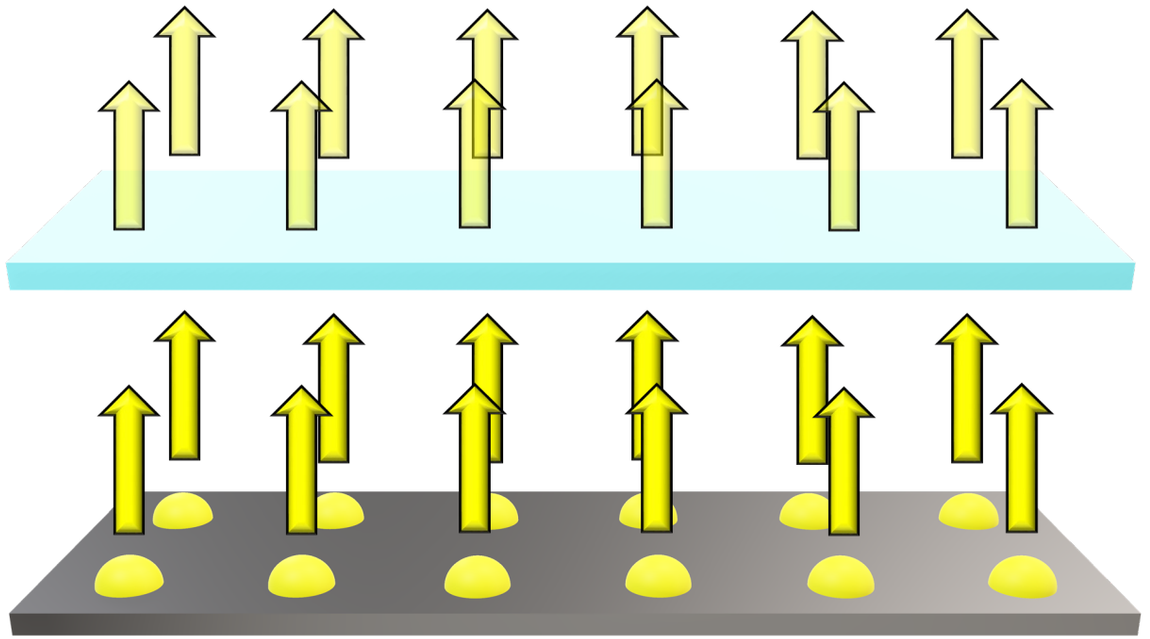
	Oleveon T8	Oleveon Retrofit
Number	28 pcs.	28 pcs.
Power	2x 58 W	2x 24 W
Luminous flux	10.000 lm	7.400 lm
Em	313 lx	232 lx
Uo	0,63	0,63

INVENTORY OF THE OLD SYSTEM DISPATCH AND PACKING ROOM



	Oleveon T8	**Oleveon Retrofit**	**Oleveon FIT (LED)**	**Oleveon FIT (LED)**
Number	28 pcs.	28 pcs.	28 pcs.	28 pcs.
Power	2x 58 W	2x 24 W	44 W	57 W
Luminous flux	10.000 lm (lamp)	7.400 lm (lamp)	6.000 lm (light fixture)	8.000 lm (light fixture)
Em	313 lx	232 lx	314 lx	403 lx
Uo	0,63	0,63	0,61	0,61

THE SUITABLE LUMINOUS FLUX FOR DIFFERENT APPLICATIONS



Useful light output: 900 lm

Optics, housing..

LED luminous flux: 1000 lm

LED board

This **Ratio** describes the **Operating efficiency**

A **LED luminaire** is often described as a **complete system**.
A **Subdivision of Lamp** and **Luminaire housing** is **not described**.
Just the u**seful luminous flux is described.**
η = 1

THE SUITABLE LUMINOUS FLUX FOR DIFFERENT APPLICATIONS

The operating efficiencies used to be in the range of approx. 60 - 85 %

Example Oleveon:
- 2x 58W
- Luminous flux of the lamps approx. 10,000 lm
- Operating efficiency = 63.5573348999023 %
- Luminous flux of the luminaire = **approx. 6,355 lm**

	Old plant	**New plant**	**Luminaire**
Stock	1x 58 W (T8)	28 W	Oleveon FIT 4000
	2x 58 W (T8)	44 W	Oleveon FIT 6000

THE SUITABLE LUMINOUS FLUX FOR DIFFERENT APPLICATIONS

	Old plant	Luminous flux lamp	New plant	Luminaire
Stock	1x 58 W (T8)	5.000 lm	28 W	Oleveon FIT 4000
	2x 58 W (T8)	10.000 lm	44 W	Oleveon FIT 6000
Hall lighting	400 W (HQL)	22.000 lm	78 W	Mirona FIT LED 13000 lm
Office	4x 18 W (T8)	5.400 lm	27 W	Belviso C1 625 LED3900 lm
Hallway	1x TC-D 26 W	1.800 lm	9,5 W	Inperla Ligra Plus 1000 lm
	2x TC-D 26 W	3.600 lm	16 W	Inperla Ligra Plus 1800 lm

NOTE THE RANGE OF APPLICATION

Increased ambient temperatures reduce the service life and increase the probability of failure of the luminaire!

PRODUCT DESCRIPTION

Luminaire type

Small recessed LED spotlight.

Applications

For prestigious lighting of offices, banks, hotels, restaurants, corridors, foyers, and sales, exhibition and conference rooms, as well as residential areas.

Mounting methods

Recessed spotlight for use in cutout ceiling apertures. Cut-out opening Ø 68 mm, Recess depth 80 mm. With rapid-mounting springs for tool-free mounting. Ceiling thickness 3 mm - 20 mm.

LED system

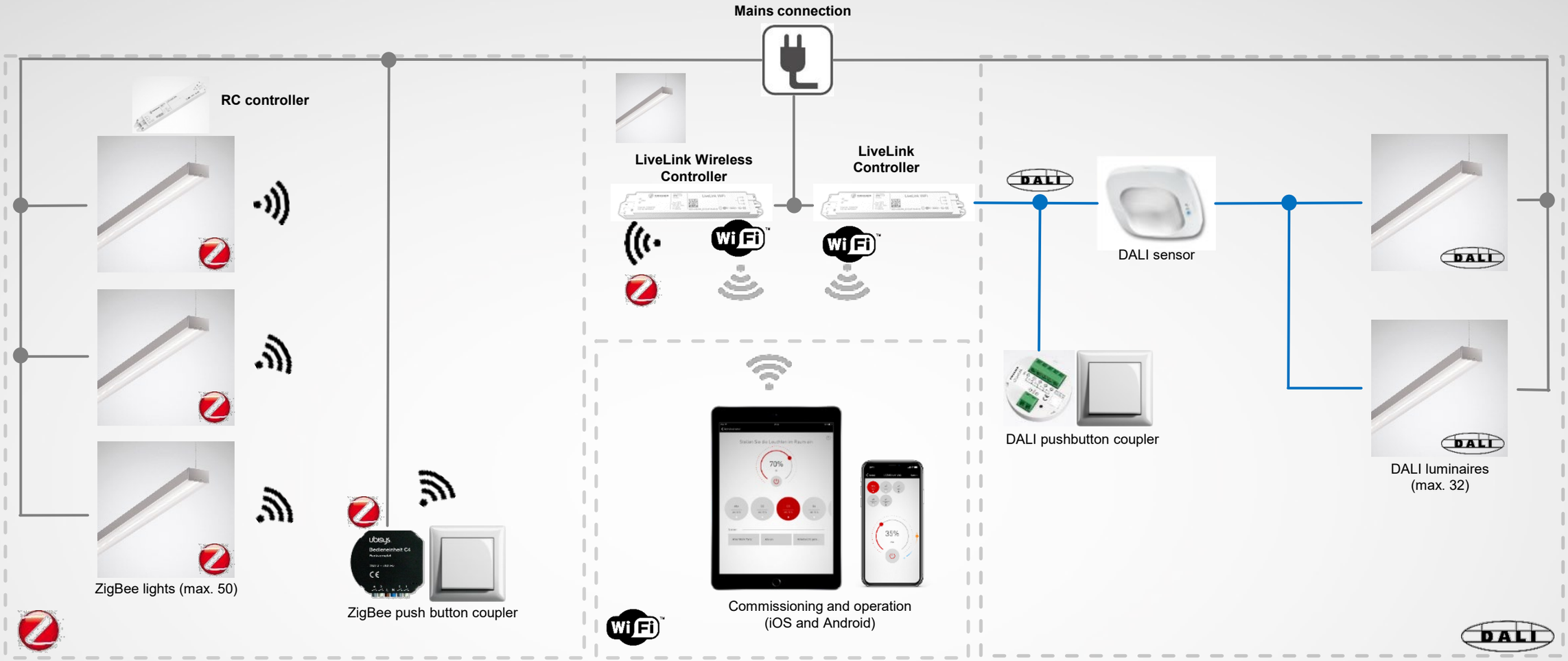
Luminaire luminous flux 900 lm, connected load 11,00 W, luminous efficiency of luminaire 81 lm/W. Light colour neutral white, correlated colour temperature (CCT) 4000 K, Colour locus tolerance (initial MacAdam) ≤ 4 SDCM, general colour rendering index (CRI) R_a > 80. Mean rated service life $L_{80}(t_q$ 25 °C) = 35,000 h, mean rated service life $L_{70}(t_q$ 25 °C) = 50,000 h.

Luminaire body

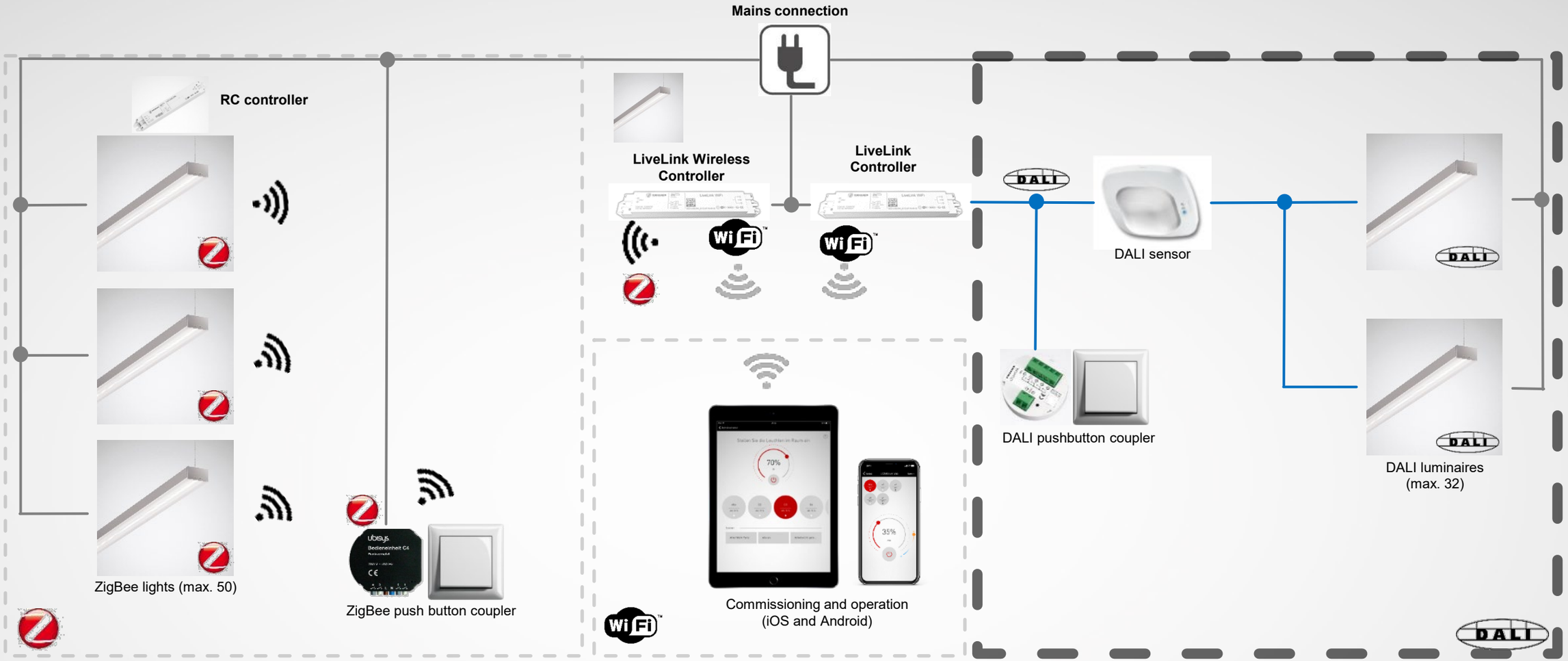
Ceiling mounting ring and spotlight head of die-cast material. Surface coated white (RAL 9016). Luminaire diameter Ø 76 mm, luminaire height 42 mm. Luminaire diameter Ø 76 mm, luminaire height 42 mm.

Light management simply and quickly explained!

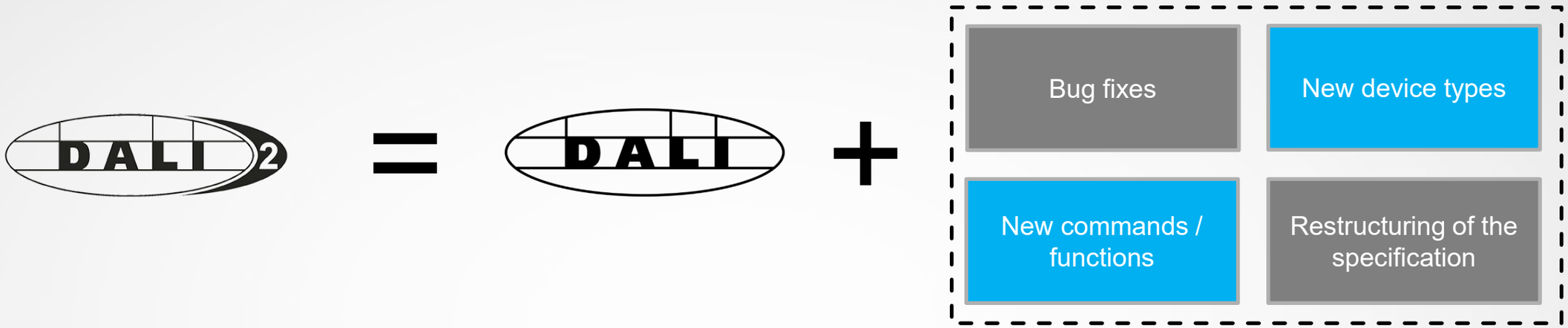
THE LINE BUNDLES AND THE WIRELESS SOLUTION



THE LINE BUNDLES AND THE WIRELESS SOLUTION



DALI 1 VS. DALI 2 THE DIFFERENCES AND THAT CHANGED ESSENTIALLY



DALI drivers can be **together with DALI2** devices in one circuit **operated in one circuit. (backwards compatibility)**

The DALI drivers do not **recognize** the **new commands** (ignore them) and **operate** in the DALI circuit **without malfunction**.

DALI 2

- Extension of IEC 62386 to include additional control devices (part 103 of the standard).
- New device types in the Sensors group, such as
  - Button,
  - Light sensors,
  - Motion sensors
  - Remote control interfaces

are now defined in the standard.

New device types

- SAVE PERSISTENT VARIABLES — Constant variables are stored in non-volatile memory.
- SET OPERATING MODE (DTR0) — Allows you to set the operating mode.
- RESET MEMORY BANK (DTR0) — Resets the memory.
- IDENTIFY DEVICE — Identifies (i.e. locates) the device.
- SET EXTENDED FADE TIME (DTR0) — An "extended fade time" (0.1 s to 16 min) (in addition to the FADE TIME)
- GO TO LAST ACTIVE LEVEL — The last "ARC POWER LEVEL" is called.

New commands / functions

- **The D4i driver standard enables IoT functions in DALI systems!**


4™

DRIVER SPECIFICATION - DATA REPORTING

Luminaire Data

- **DALI (DiiA) Part 251 - Luminaire information & rated values**
- Contains the connected load & voltage of the luminaire, luminous flux, colour temperature (CCT) & colour rendering index (CRI), light distribution, luminaire colour and other luminaire data (type, article number, serial number, etc.).

Energy Data

- **DALI (DiiA) Part 252 - Energy Reporting**
- Active power, apparent power, load-side power (LED module)

Diagnoytic Data

- **DALI (DiiA) Part 253 - Diagnostics & Maintenance**
- Failure conditions for ballasts and lamps, including meters. Ballast information: Operating time, number of starts, supply voltage and frequency, power factor, temperature and output current.
- Light source information: Operating voltage, current, temperature, light source start counter, light source on time.

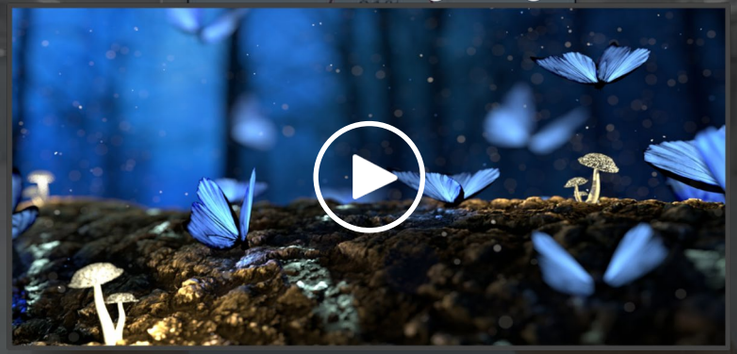
Constant current and constant voltage driver

The difference!

LIGHT MANAGEMENT SYSTEM

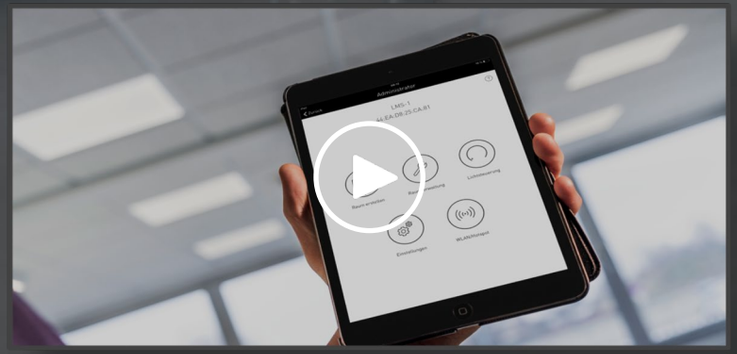
Dimming LEDs - a must?

Economy and ecology
in outdoor lighting



LiveLink Basic" lighting management system

Light management system "LiveLink Wifi



LiveLink Premium" light management system

Thank you so much for being there!

If you have any questions or suggestions, please feel free to contact us at:

akademie@trilux.de