LIGHT MANAGEMENT IS VIVARES
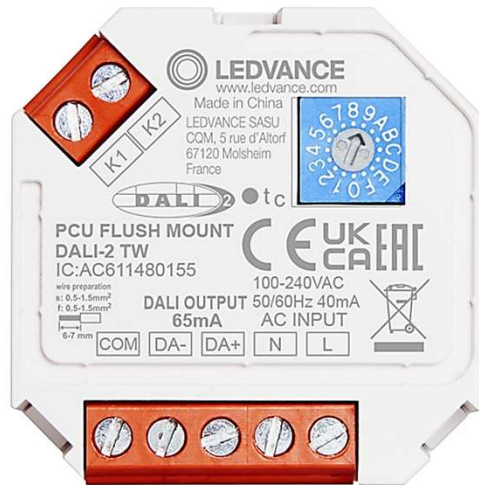
Application guide

PCU FLUSH MOUNT DALI-2 TW

Status: December 2024 | LEDVANCE
Subject to change without and notes. Errors and omission excepted.

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Application guide
PCU FM DALI-2 TW

PCU FLUSH MOUNT DALI-2 TW

DIN Rail 35 adapter
included in each product delivery

EAN: 4058075837584

Application guide
PCU FM DALI-2 TW

Table of contents

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Application guide
# PCU FM DALI-2 TW – Features & benefits

Product Features

- **Dimming and switching of DALI fixtures** via standard push to make buttons
- **Change of color temperature** in combination with DALI DT8 drivers
- Control **up to 25 DALI LED drivers per** active **control unit***

Product Benefits

- **All in one solution with integrated DALI power supply**
- **Plug and control ready**
- **Interconnection of up to 4 PCU's** with **automatic synchronization** via DALI
- **Suitable for rooms with separation walls**
- Possibility of **combination with standard motion detectors**
- **Fits into standard flush device boxes** with > 50mm depth
- **35 mm DIN rail or surface mounting option** via included snap-on adapter
- **Works in active*** (= mains powered) **or**
  passive mode (= without mains power / powered via DALI)
- Automatic or manual **memory of switch on level**
- Individual **setting of lowest dimming level**
- **Configuration of power on state** after mains interruption by rotary switch
- **Can be used as** 65mA **DALI Power supply****

Application areas

- **Conference, meeting rooms**
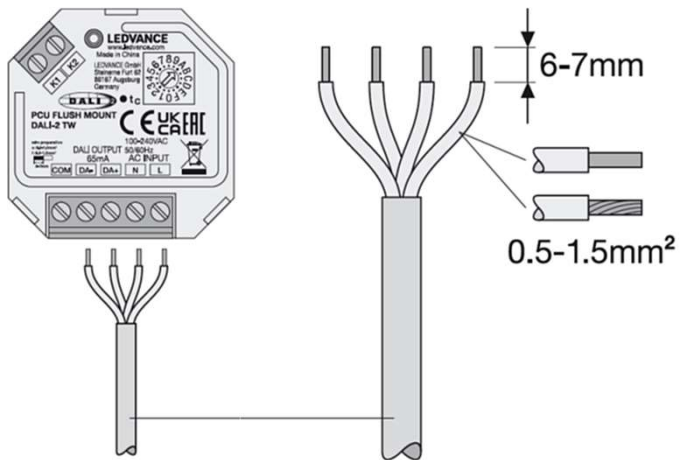- Residential / Shop/ Hospitality areas
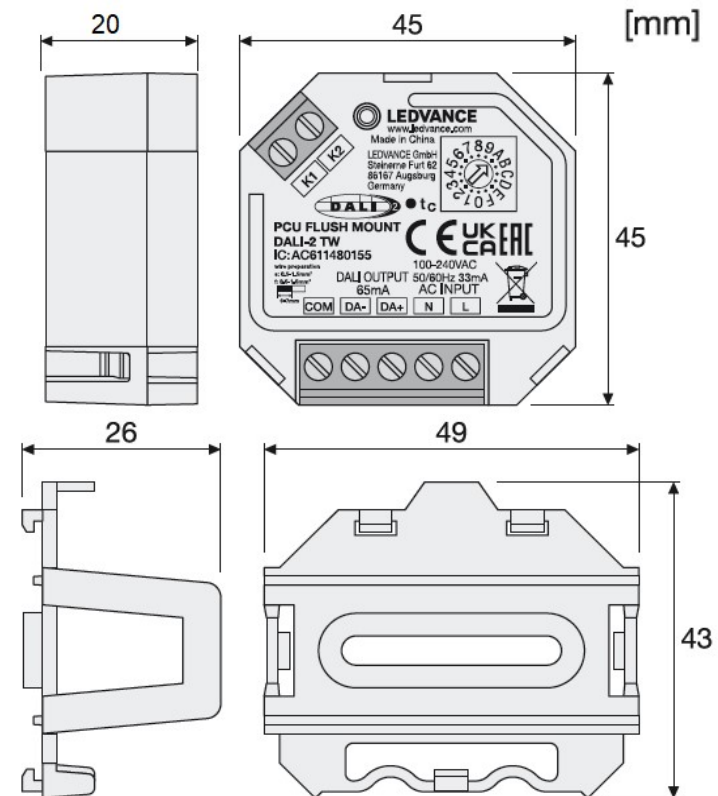
**by setting the rotary switch to position 3.

Application guide
PCU FM DALI-2 TW – Flush box mounting

Wire preparation

Mounting into a flush box

6-7mm

0.5-1.5mm²

DA+
DA-
L
N

K1, K2, COM

⚠ **Switch off mains <u>and</u> DALI supply during installation !**

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Application guide
PCU FM DALI-2 TW – 35mm DIN rail mounting / surface mounting

Wire preparation

6-7mm

0.5-1.5mm²

Mounting onto a 35m DIN rail

"click"

"click"

"click"

"click"

❶

❷

❸

Surface mounting

❶

❷

❸
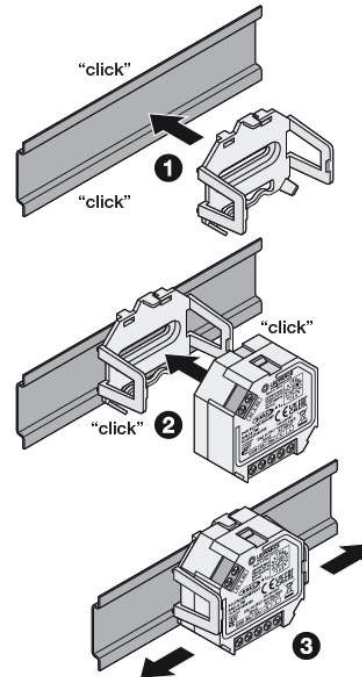
⚠ **Switch off mains and DALI supply during installation !**

Application guide
PCU FM DALI-2 TW – Configuration: Behaviour after mains interruption

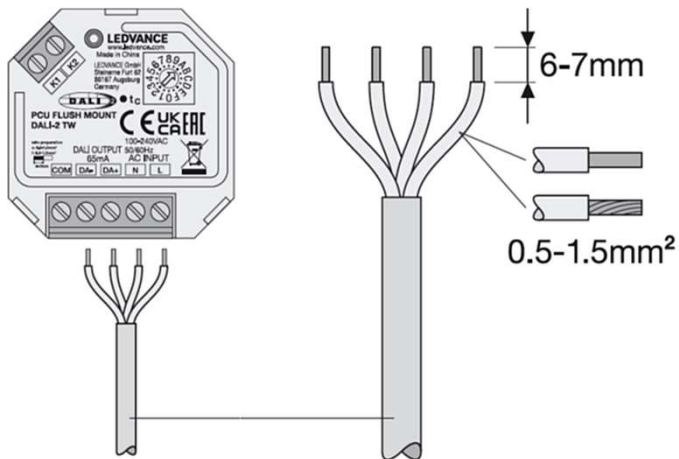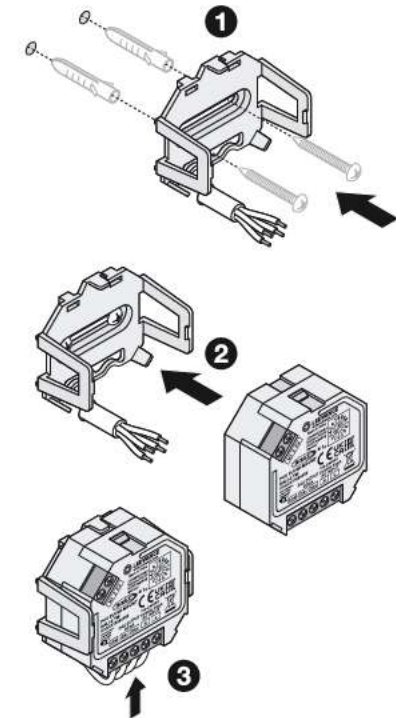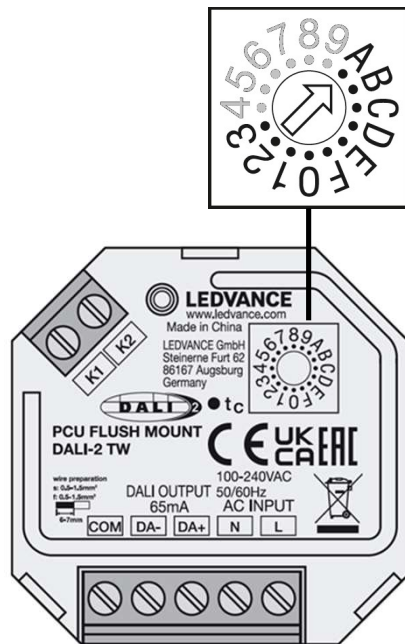State of the lighting after mains interruption can be set by the rotary switch on the frontside of the PCU

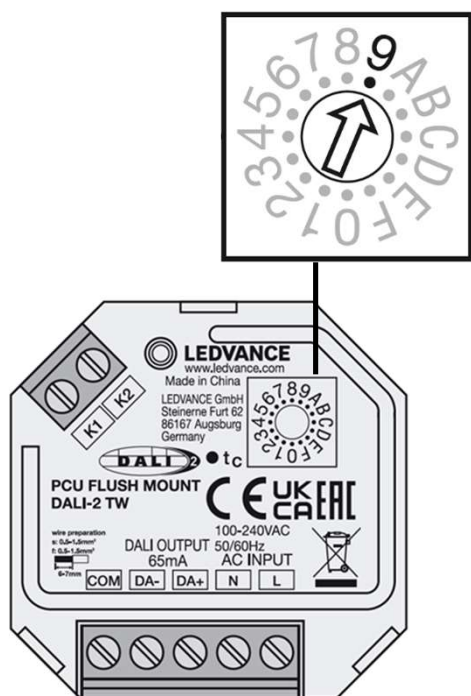| Setting	Meaning
A	Last dimming level / last CCT and switching state before mains interruption will be re-established
B*	Dimming level and CCT stored by Double Click in rotary switch setting A
C	10% brightness, CCT = 4000K
D	20% brightness, CCT = 4000K
E	30% brightness, CCT = 4000K
F	50% brightness, CCT = 4000K
0	80% brightness, CCT = 4000K
1	100% brightness, CCT = 4000K
2	OFF (Light level 0%)
3	No command send after Power up ← *In this setting the DALI PCU works as pure DALI Power Supply*
4-9	Reserved (do not use)

⚠ **Switch off mains <u>and</u> DALI supply before accessing the rotary switch!**

* In Setting B the double click is <u>disabled</u>. Please store the memory value to be used after mains interruption by setting the rotary switch temporarily to position A.

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Application guide
PCU FM DALI-2 TW – Configuration: RESET

RESET PCU and the connected DALI drivers		Remark
Step 1:	**Switch off mains** of the PCU and of all connected devices, then **set rotary switch** on the backside of the PCU **to position 9**	Note previous position of the switch
Step 2:	**Switch on mains** of the PCU and of all connected devices	
Step 3:	**Press push button connected to input K1 >10s** until light goes to 50%	A DALI RESET command is sent to all connected drivers and the minimal dimming level is reset to 1%. If multiple PCU are interconnected and powered up, RESET is performed by all PCU.
Step 4:	**Switch off mains** of the PCU and of all connected devices, then **set rotary switch** back **to the original position**	
Step 5:	**Switch on mains** of the PCU and of all connected devices	

⚠ **Switch off mains <u>and</u> DALI supply before accessing the rotary switch on the frontside!**

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Application guide
PCU FM DALI-2 TW – Configuration: Minimum dimming level
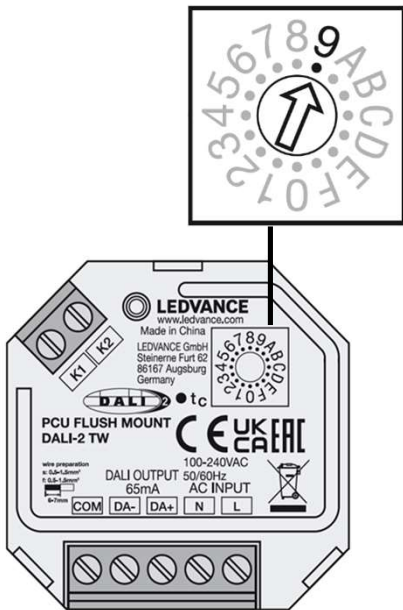
| Setting the minimal dimming level		Remark
Step 1:	**Switch off mains** of the PCU and of all connected devices, then **set rotary switch** of the PCU **to position 9**	Note previous position of the switch
Step 2:	**Switch on mains** of the PCU and of all connected devices	
Step 3:	**Adjust brightness level by Long Press**(es) to push button connected to K1	If 1% or low dimming levels cannot be achieved, please RESET the PCU and the drivers.
Step 4:	**Double click** push button connected to K1	Current brightness level is stored as new minimum dimming level. If multiple PCU are interconnected and powered up, new Minimum level applies to all PCU.
Step 5:	**Switch off mains** of the PCU and of all connected devices, then **set rotary switch back to the original position**	
Step 6:	**Switch on mains** of the PCU and of all connected devices	

⚠ **Switch off mains and DALI supply before accessing the rotary switch on the frontside!**
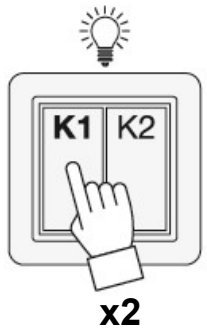
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Application guide
PCU FM DALI-2 TW – User operation

Switch ON / OFF
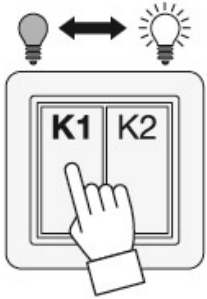
- To switch on / off short push the push button connected to K1
- Switching direction toggles with each short push

Define manual Switch ON behaviour

- To store a fixed brightness and CCT for Switch ON, adjust brightness and CCT value as desired and store by a double click to the push button connected to K1
  (Note: Double click is disabled in turnkey position B)

- Storage is indicated by two times blinking of the lights.

x2
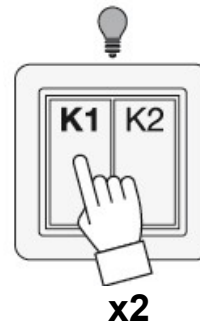
- To delete a fixed brightness and CCT for Switch ON, switch off the light then double click to the push button connected to K1
  (Note: Double click is disabled in turnkey position B)

- Deletion is indicated by lights switching ON to 100%@4000K. After deletion of fixed levels, the last values before manual OFF will be used for Switch ON.

x2

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Application guide
PCU FM DALI-2 TW – User operation

Dimming of the light level
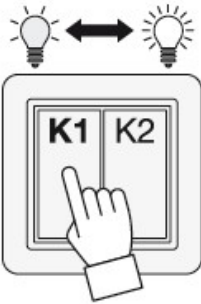
- To dim the current light level, Long Press the push button connected to K1
- The dimming direction toggles with each Long Press

Change the colour temperature

2700K ⟷ 6500K

- To change the colour temperature (CCT), Long Press the push button connected to K2
- The CCT change direction toggles with each Long Press
  (Note: light must be switched on before changing the CCT)

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Application guide
PCU FM DALI-2 TW – Application example 1a: Meeting room ≤ 25 luminaires

Description

FUNCTIONALITY
- Up to 25 luminaires shall be controlled by a broadcast DALI signal
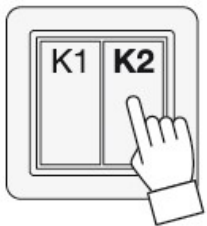- Dimming and switching as well as setting the color temperature of all luminaires shall be possible at both entry doors of the room

PRINCIPLE SETUP
- A PCU TW is installed at one entry door and a 2-fold push button connected to it
- The PCU is connected to mains and acts as central DALI bus power supply (= active PCU)
- The 2-fold push button at the second door is also wired to the PCU
- All luminaires are connected to mains and the DALI bus

OPTIONS
- If number of luminaires is > 25, please use a second PCU as additional DALI Power supply
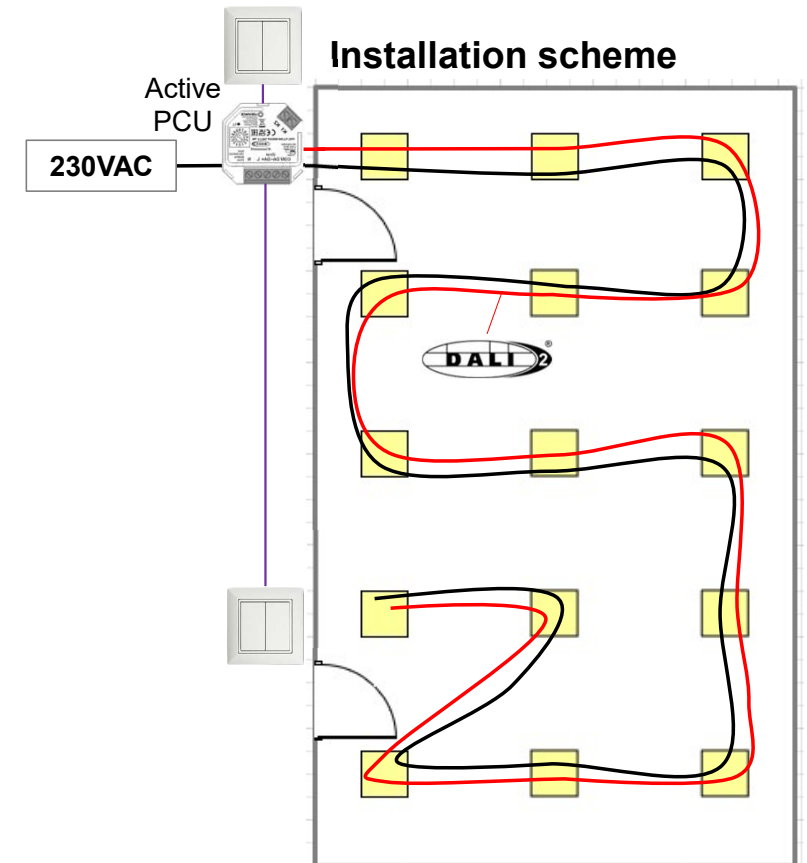
Installation scheme

Active PCU

230VAC

DALI 2

Application guide
PCU FM DALI-2 TW – Application example 1a: Meeting room ≤ 25 luminaires

Installation

Safety
- <u>Switch off mains and DALI supply during installation !</u>
- DALI must be treated like mains voltage

Wiring
- Max. <u>total</u> DALI wire length: 300m
- Max. wire length for push button connections: 50m
- Recommended DALI wire diameter 1,5mm²
- DALI and mains voltage may be routed in the same cable (e.g. NYM 5x1,5mm²)

Hints:
- *Ensure correct polarity DA+/DA- when connecting the second PCU*

Commissioning
- To avoid that lights are switched on after a temporary mains interruption please set turnkey PCU to position A (=last state) or position 2 (=OFF)

Possible system size
- Max. 25 DALI drivers per active DALI PCU
- Max. 4 DALI PCU per system
- Each Active PCU can power 1 passive PCU via DALI bus

Wiring diagram 1a:

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Application guide
PCU FM DALI-2 TW – Application example 1b: Meeting room >25 luminaires
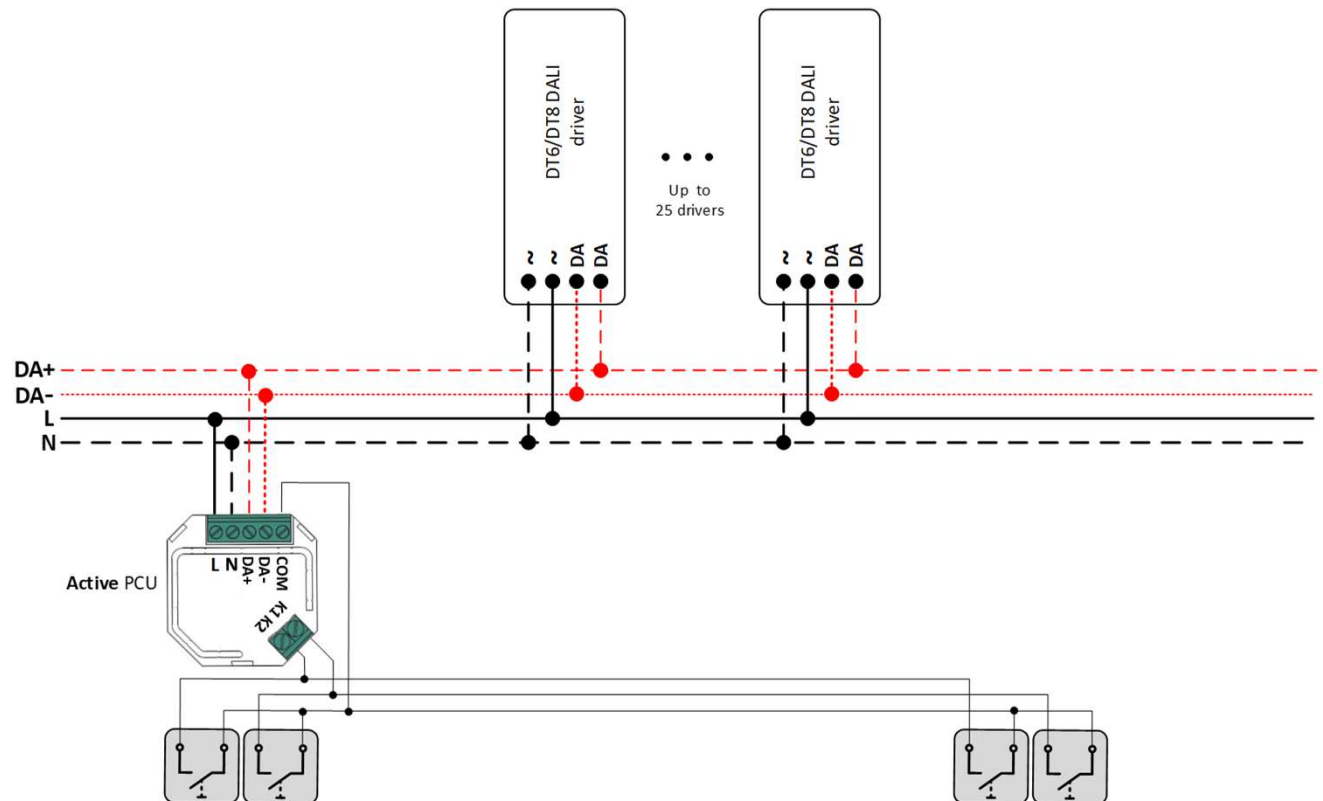
Description

FUNCTIONALITY
• Up to 50 luminaires shall be controlled by a broadcast DALI signal
• Dimming and switching as well as setting the color temperature of all luminaires shall be possible at both entry doors of the room

PRINCIPLE SETUP
• A PCU TW is installed at both entry doors
• Both PCU are connected to mains and acts as DALI bus power supply (= active PCU)
• All luminaires are connected to mains and the DALI bus

OPTIONS
• If number of luminaires is < 25, the second PCU does not need a mains connection (=passive PCU)

Installation scheme

Active PCU

230VAC

Active PCU

Application guide
PCU FM DALI-2 TW – Application example 1b: Meeting room >25 luminaires

Installation

Safety
- Switch off mains and DALI supply during installation !
- DALI must be treated like mains voltage

Wiring
- Max. total DALI wire length: 300m
- Recommended DALI wire diameter 1,5mm²
- DALI and mains voltage may be routed in the same cable
  (e.g. NYM 5x1,5mm²)

Hints:
- *Ensure correct polarity DA+/DA- when connecting the second PCU*
- *Respect the max. number of luminaires per circuit breaker*

Commissioning
- To avoid that lights are switched on after a temporary mains interruption please set turnkeys of all PCU to identical position A (=last state) or position 2 (=OFF)

Possible system size
- Max. 25 DALI drivers per active DALI PCU
- Max. 4 DALI PCU per system
- Each Active PCU can power 1 passive PCU via DALI bus

Wiring diagram 1b:

Application guide
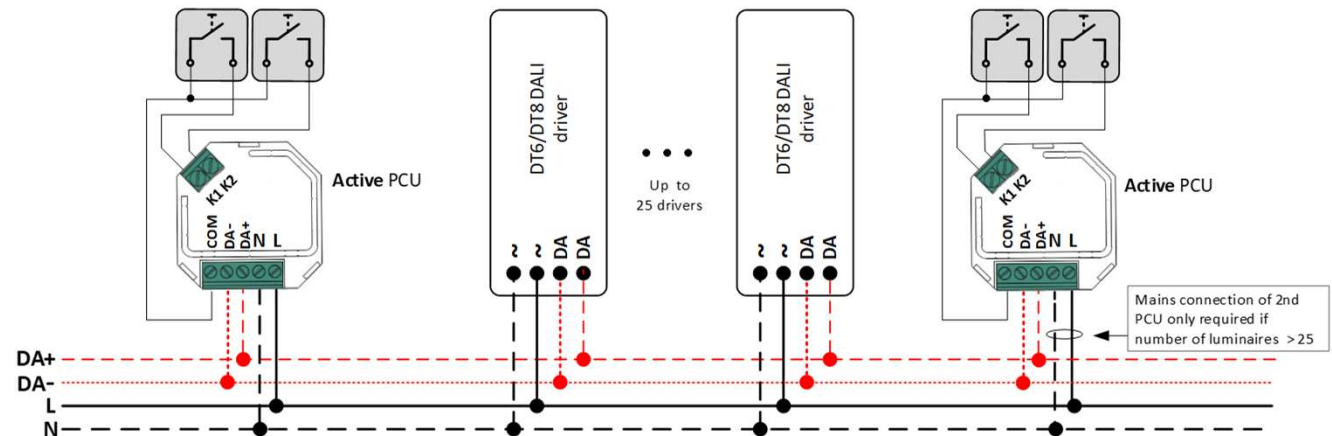## PCU FM DALI-2 TW – Application example 2: Room with motion detectors

Description

FUNCTIONALITY
• Up to 50 luminaires shall be switched on by standard motion detectors
• Dimming and switching of all luminaires shall be possible at both entry doors of the room if persons are present

PRINCIPLE SETUP
• A PCU TOUCH is installed at both entry doors
• The PCU at one door is connected to mains and acts as central DALI bus power supply (= active PCU)
• The second PCU is connected to DALI only and is supplied from the DALI bus (= passive PCU)
  All luminaires are connected to the DALI bus
• Mains of all luminaires and the active PCU is switched via the load contacts of the detectors

OPTIONS
• If number of luminaires is ≤ 25, only one PCU is required and the push buttons at the second door can be directly connected to the active PCU
• If number of luminaires is > 25, the second PCU also has to be connected to mains

Installation scheme

Application guide
PCU FM DALI-2 TW – Application example 2: Room with motion detectors

Installation

Safety
- Switch off mains and DALI supply during installation !
- DALI must be treated like mains voltage

Wiring
- Max. total DALI wire length: 300m
- Recommended DALI wire diameter 1,5mm²
- DALI and mains voltage may be routed in the same cable (e.g. NYM 5x1,5mm²)

Hints:
- *Ensure correct polarity DA+/DA- when connecting the second PCU*
- *Respect the max. number of luminaires per circuit breaker and max. load at the switched sensor output*

Commissioning
- Fully automatic ON/OFF by motion detection: Set turnkeys of all PCU to identical position B*-F or 0,1
- Semi automatic (= Manual ON via PCU and automatic OFF via Motion detector): Set turnkeys of all PCU to pos. 2

Possible system size
- Max. 25 DALI drivers per active DALI PCU
- Max. 4 DALI PCU per system
- Each Active PCU can power 1 passive PCU via DALI bus

Wiring diagram 2·
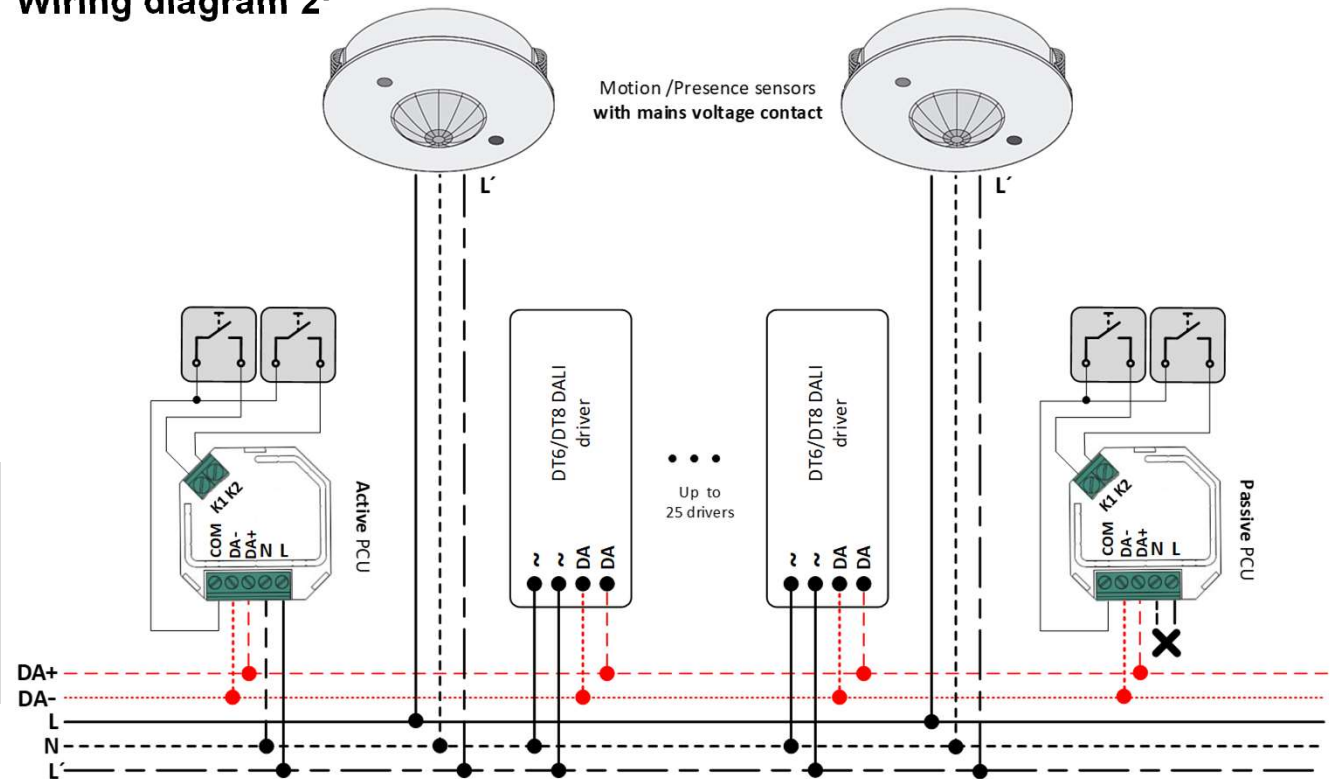
* If turnkey pos. B is used, set turnkey of one PCU temporarily to pos. A to store Switch ON level / Switch ON CCT by Double click

Application guide
PCU FM DALI-2 TW – Application example 3: Room with room with partition walls

Description

FUNCTIONALITY
- Central dimming and switching of all luminaires shall be possible at both entry doors of the room when separation wall is open
- Independent control of each part room shall be possible as soon as soon as the room is split in two separate rooms by closing the wall

PRINCIPLE SETUP
- A PCU is installed at both entry doors
- Both PCU at are connected to mains and act as DALI bus power supply (= active PCUs)
- While the DALI wires of both part rooms are interconnected when the wall is open, the DALI connection between both parts is interrupted at one pole when the wall is closed
- All luminaires are connected to mains and the DALI bus of the DALI PCU of the corresponding part room.

OPTIONS
- To control more than 25 luminaires in each room, connect an additional active PCU in each room part with turnkey set to position 3, acting as pure DALI power supply.

Installation scheme

Active PCU

230VAC

Active PCU

230VAC
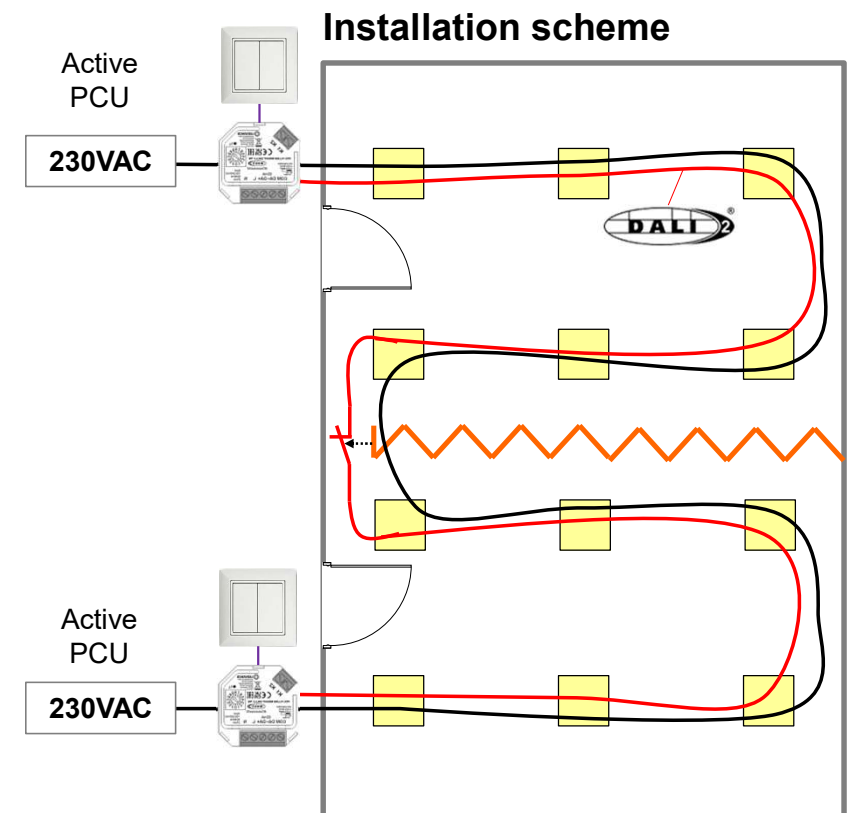
Application guide
PCU FM DALI-2 TW — Application example 3: Room with room with partition walls

Installation hints

Safety
- Switch off mains and DALI supply during installation !
- DALI must be treated like mains voltage

Wiring
- Max. total DALI wire length: 300m
- Recommended DALI wire diameter 1,5mm²
- DALI and mains voltage may be routed in the same cable
  (e.g. NYM 5x1,5mm²)
  Hints:
  - *Ensure correct polarity DA+/DA- when interconnecting the PCU*
  - *Respect the max. number of luminaires per circuit breaker*
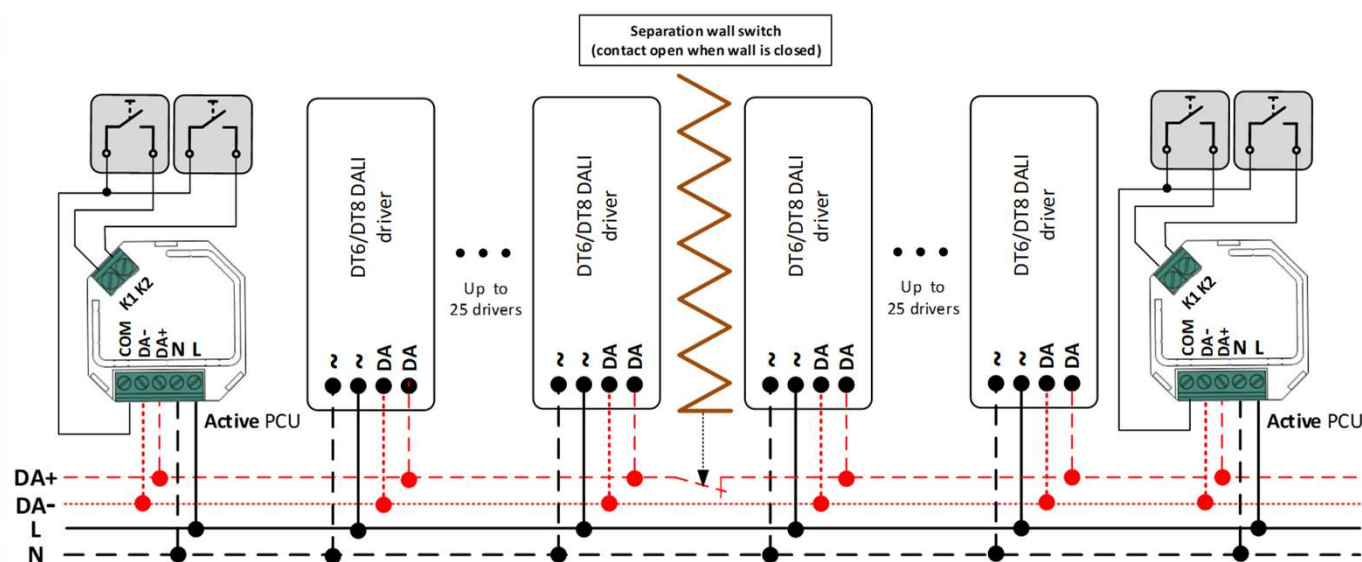
Commissioning
- To avoid that lights are switched on after a temporary mains interruption please set lower turnkeys of all PCU to identical position A (=last state) or position 2 (=OFF)

Possible system size
- Max. 25 DALI drivers per active DALI PCU
- Max. 4 DALI PCU per system
- Each Active PCU can power 1 passive PCU via DALI bus

Wiring diagram 3:

Application guide
PCU FM DALI-2 TW – Application example 4: Room with partition walls and motion detectors

Description

FUNCTIONALITY
- If separation wall is closed light is switched on individually in each room part when motion is detected and can then be dimmed and switch via the PCU of this room part.
- If separation wall is open light is switched on centrally for the whole when motion is detected by one of the sensors. If the room is occupied and the wall is open, a central manual control of all luminaires is possible via both PCU.

PRINCIPLE SETUP
- A PCU is installed at both entry doors
- All PCU are connected to mains (= active PCUs)
  Luminaires of a room part are connected to the DALI bus of the PCU in this room part
- Mains supply of the luminaires and the PCU in a part room are switched via the motion detector in this part
- When separation wall is opened the DALI Bus of the part rooms are interconnected
- When separation wall is opened the mains output of the motion detectors are interconnected

OPTIONS
- To control more than 25 luminaires in each room, connect an additional active PCU in each room part with turnkey set to position 3, acting as pure DALI power supply.

Installation scheme
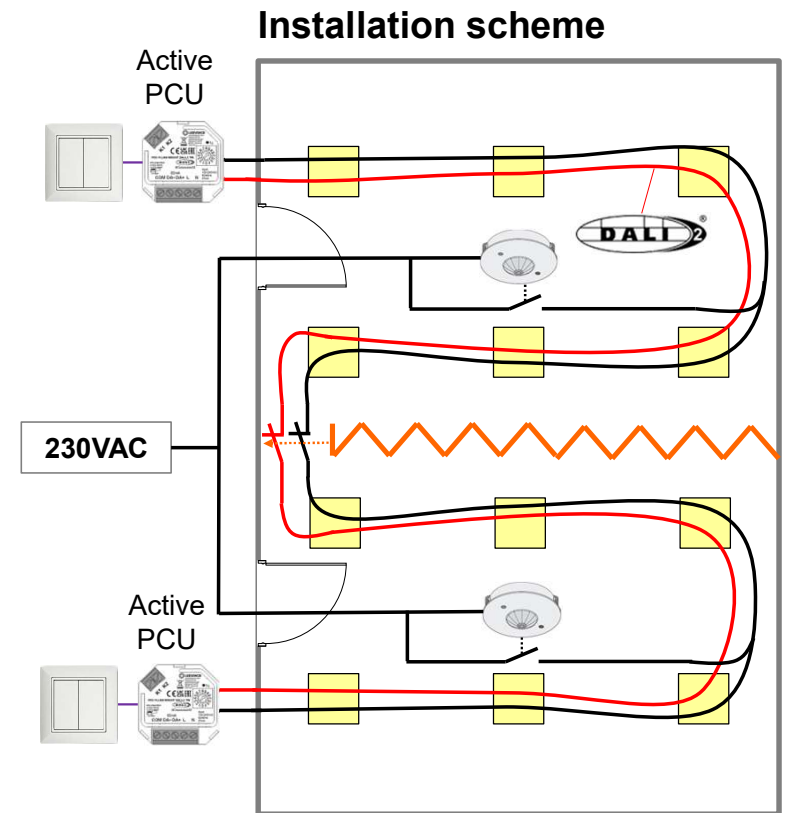
Application guide
PCU FM DALI-2 TW – Application example 4: Room with partition walls and motion detectors

Installation hints

Safety
- Switch off mains and DALI supply during installation !
- DALI must be treated like mains voltage

Wiring
- Max. DALI wire length (total for all room parts): 300m
- Recommended DALI wire diameter 1,5mm²
- DALI and mains voltage may be routed in the same cable (e.g. NYM 5x1,5mm²)

  Hints:
  - *Ensure correct polarity DA+/DA- when interconnecting the PCU*
  - *Respect the max. number of luminaires per circuit breaker and max. load at the switched sensor output*

Commissioning
- Fully automatic ON/OFF by motion detection:
  Set turnkeys of all PCU to identical position B-F, or 0,1
- Semi automatic (= Manual ON via PCU and automatic OFF via Motion detector): Set turnkeys of all PCU to position 2

Possible system size
- Max. 25 DALI drivers per room part
- Max. 4 room parts with one active DALI PCU each

Wiring diagram 4a :
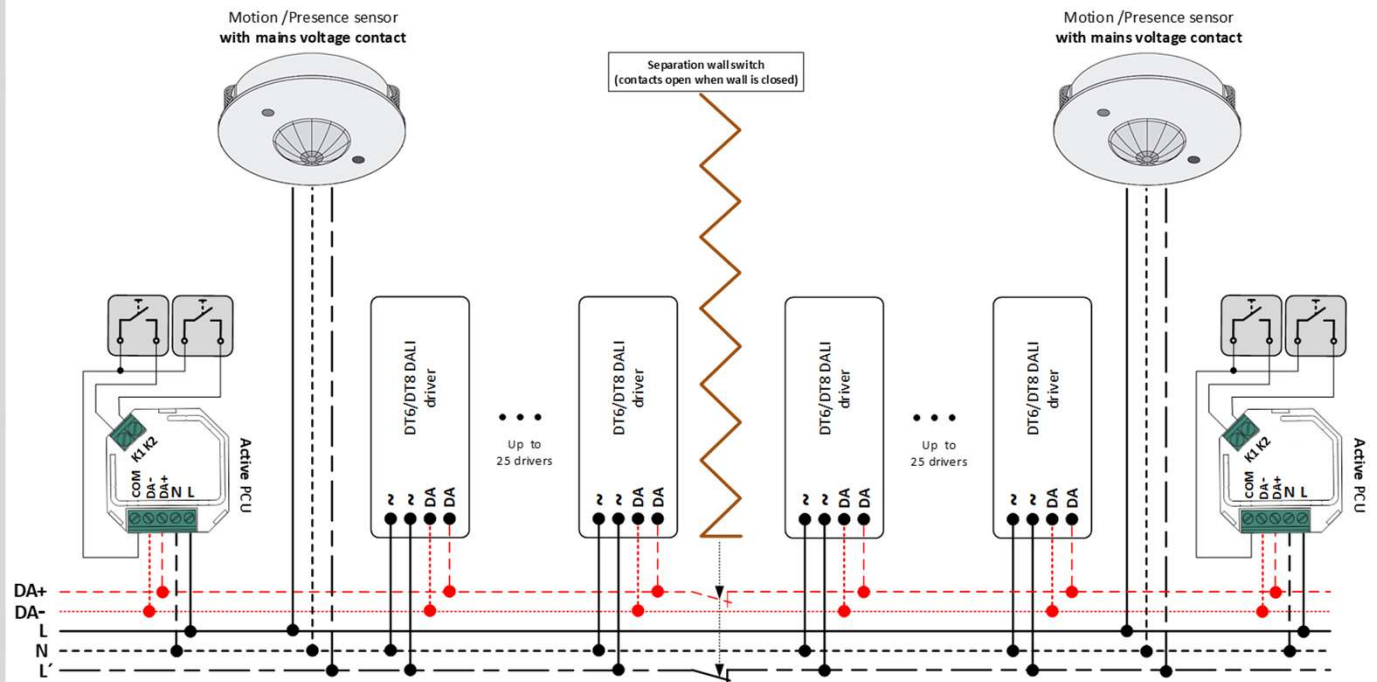
Application guide
PCU TW — Application example 4: Room with motion detectors, separate mains circuits

Wiring diagram 4b: dividable room with motion detectors, separate mains circuits for the part rooms

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Application guide
PCU FM DALI-2 TW

Questions and Answers

Q1: How can I set an individual level / a individual CCT for automatic switch on when motion is detected?
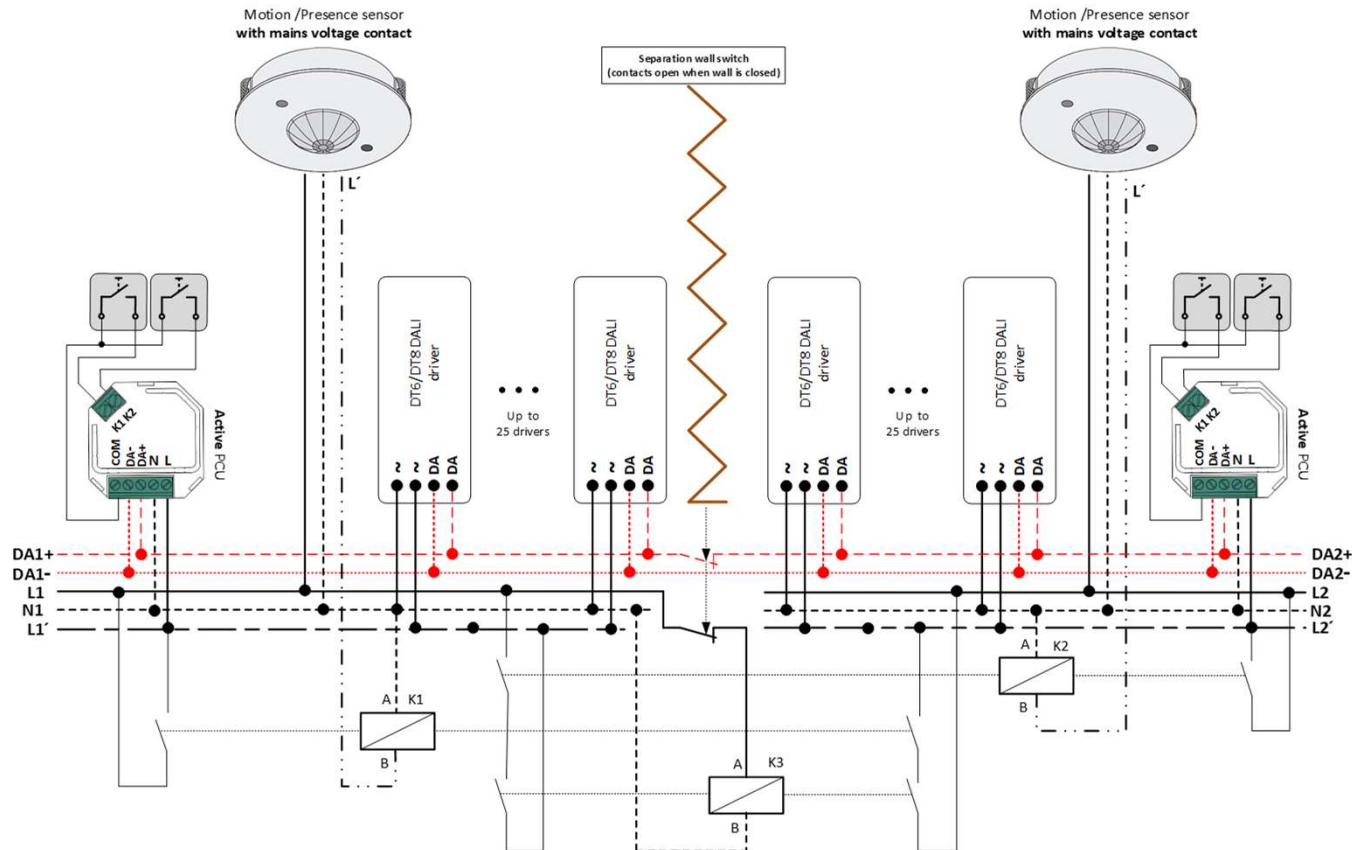**A1:** Temporarily set the turnkey of all PCU to position A, ensure that separation wall is open and the PCU are interconnected via DALI and are powered up.
The adjust the brightness and the CCT to the desired levels and store this level individually by touch >5s to S1 element of all individual PCUs .
Finally set the turnkey of all PCU to position B

Q2: As the of room parts are bigger, they can not be covered by the detection area of a single motion detector, how can I increase the number of detectors?
A2: If you need multiple detectors in one part room just interconnect the Outputs with switched phase (L') of the detectors

Q3: What if the high number of drivers per part room exceeds the load capacity of the switching contact of the motion detector?
A3: If the max. capacitive load of the detector is not sufficient, please use a power conductor / power relay in-between luminaires and load contact of the motion detector

Q4: What if the room parts are connected to different phases / circuit breakers and may therefore not be interconnected by the switch contact of the movable wall?
A4: In this case you need additional power conductors, please see corresponding wiring diagram

Q5: Can I use also daylight dependent control?
A5: If the selected motion detectors have an integrated light sensor, it is possible to set a brightness threshold directly at the sensors. That avoids an unnecessary switch on if sufficient daylight is available. A closed loop / daylight harvesting control is not possible

Q6: Can I use DALI sensors instead of the standard motion detectors?
A6: No, the PCU does not support other DALI control devices such as DALI Sensors or DALI Push button couplers.

Q7: Can I connect a PCU to another DALI control system or a BMS solution?
A7: No, the PCU is a standalone control solution

Q8: Is it possible to control more than 25 drivers with one single PCU ?
A9: Yes. If you need to control more luminaires, please use an additional active PCU with turnkey set to position 3. Consider 2mA as DALI current consumption for each driver. Ensure that the total current of all PCU does not exceed 250mA by more than 10%.

Application guide
PCU FM DALI-2 TW

Questions and Answers

Q10: Can I mix/interconnect the PCU TW with MCU SELECT TW and MCU TOUCH TW in the same installation?

A10: In principle that is possible, as there may be some limitations concerning the synchronization MCU and PCU, therefore this combination is officially not recommended

Application guide
PCU FM DALI-2 TW

Troubleshooting

Q11: What can I do if some luminaires have a different dimming behavior than the rest ?
A11: Most probably not all DALI drivers have ex-factory settings. Please perform a RESET as described at the beginning of this application guide.

Q12: I have installed two PCU, why do the lights behave differently depending which PCU I use?
A12: The PCU should have identical turnkey settings. To ensure a complete synchronization, the PCU must be interconnected and powered when configuration settings such as storing a Switch On level or a Min level are done.

Q13: The PCU is not working, and lights stay always at 100%, what is the possible root cause?
A13: Most probably the DALI bus voltage is missing, and the luminaires are at System failure level. Please check DALI voltage with a multimeter (typically: ~16V DC).
Possible root cause: The PCU has no mains supply or the DA+/DA- wires of interconnected are mixed up at one PCU or the number of drivers / passive PCU is too high

Q14: The light level is temporarily below the configured Minimum dimming Level?
A14: Most probably the Power ON level set by the rotary switch on the PCU is lower than the manually configured minimum dimming level. To avoid inconsistencies please select a higher Power ON level / suitable Power On state by choosing a different rotary setting.

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Application guide
PCU FM DALI-2 TW

Technical data

	PCU TW
Input voltage range (AC)	100-240V (50/60Hz)
Power consumption	0.7-2.5W
Allowed wire diameter (L,N, DA+, DA-)	0.5-1.5mm²
Protection class	II
Protection type	IP 20
Ambient temperature range	-20…+50°C
Humidity range	10-95%
Max. total DALI wire length	100m@0.5mm² / 200m@1.0mm² / 300m@1.5mm²
Max. wire length to push buttons	50m
Max. DALI output current*	65mA
DALI input current**	10mA
Dimming range	1-100%
CCT setting range	2700-6500K
Dimensions (l x w x h)	45x45x20mm
Net weight	44g
Lifetime	50.000h

*Mains supplied PCU (=active PCU) / **DALI supplied PCU (= passive PCU)

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THANK YOU