

## SENSOTEC Luminaire-integrated modules

|           |                   |
|-----------|-------------------|
| 110046819 | Control CD DALI-2 |
| 110046818 | Control CD COM1   |
| 110046814 | Sensor ED HF1     |
| 110046813 | Sensor ED HF2     |
| 110046816 | Sensor ED PIR     |



### Function description

The new SENSOTEC Control CD COM1 and DALI-2 as well as ED HF1, HF2 and PIR sensors let you add innovative sensor technology to your products.

Designed for integrated applications, the HF sensor modules feature the latest technology from STEINEL. Capable of detecting movement through glass and non-metallic materials, either module can be installed without a problem inside luminaires, mirror cabinets etc. In addition, a special lens with an enhanced human-presence and movement detection zone has been developed for the PIR sensor. All sensor versions communicate via an interface with the controller which automatically identifies them. As a result, the optimum sensor technology can be selected for any particular application.

The DALI-2 controller gives innovative manufacturers a wide range of practical functions:

- Group interconnection
- Constant-lighting control
- Dimming of main and/or basic light

### Benefits

- Only one controller for different sensor technologies
- User-specific remote controls (RC) to simplify organisation of control activities: service RC and user RC
- Decentralised programming. Direct feedback is provided on the spot while programming is in progress
- Switched L' output for minimising standby consumption by completely disconnecting the driver from the power supply
- Selectable constant-lighting control with light-level teach-in function (Teach)\*
- Sensor mode with basic light level and main light level governed by ambient brightness\*
- Activation of up to 15 DALI-2 electronic ballasts per broadcast network\*
- Parameters can be reset throughout the system via DALI-2 chain\*
- No addressing, as networks are created by cable\*
- Functionality for grouping and un-grouping networks\*

\* Controller DALI-2 only

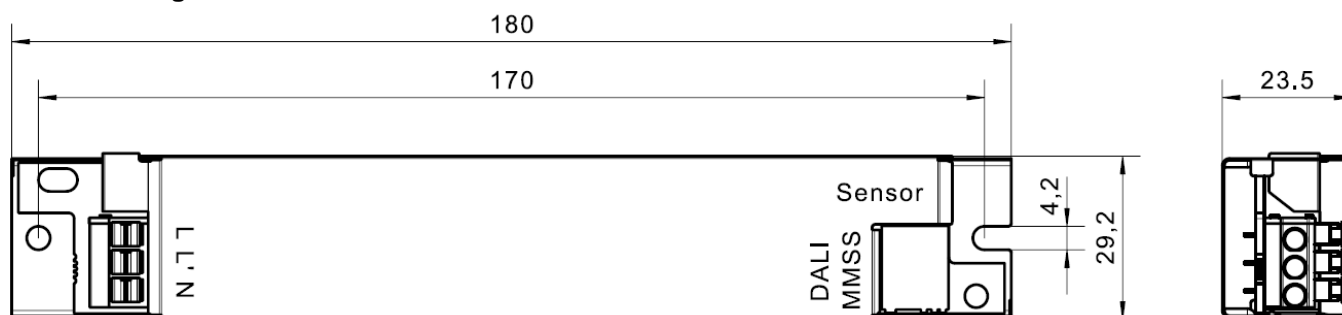
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### Controller technical specifications

|                                     | Control CD DALI-2   | Control CD COM1   |
|-------------------------------------|---|---|
| Type                                | 9002  | 9001  |
| Dimensions                          | 180 x 29.2 x 23.5 mm, hole spacing 170 mm   | 180 x 29.2 x 23.5 mm, hole spacing 170 mm   |
| Power supply                        | 220 - 240 VAC, 50 / 60 Hz   | 220 - 240 VAC, 50 / 60 Hz   |
| Power consumption                   | < 300 mW, without load  | < 300 mW, without load  |
| connection SS                       | Master/master IN circuit  | -   |
| DALI-2 connection MM                | Master/master OUT circuit<br>Broadcast electronic-ballast control                     | -   |
| Sensor connection                   | Sensor HF1, HF2, PIR  | Sensor HF1, HF2, PIR  |
| Remote controls supported*          | SENSOTEC Remote Control RCS2<br>(service remote control)<br>RC4 (user remote control) | SENSOTEC Remote Control RCS2<br>(service remote control)<br>RC4 (user remote control) |
| Reach setting ranges**              | 0 - 100%, in 10% steps  | 0 - 100%, in 10% steps  |
| Basic light level setting ranges*** | 0 - 45%, in 5% steps  | -   |
| Main light level setting ranges     | 55 - 100%, in 5% steps  | -   |
| Basic light stay ON time            | 1 min, 5 min, 10 min, all the time  | -   |
| Main light stay ON time             | 30 sec, 5 min, 15 min, 30 min   | 30 sec, 5 min, 15 min, 30 min   |
| Set brightness thresholds           | 4 stages  | 4 stages  |
| Set brightness settings             | 4 stages  | 4 stages  |
| Teach function                      | Provided  | Provided  |
| Daylight operation                  | Provided  | Provided  |
| Manual override 4 h ON/OFF          | Provided  | Provided  |
| Light adjustment                    | 0 - 100%, in 5% steps   | -   |
| Parameter sync                      | Provided  | -   |
| Luminaire grouping                  | Provided  | -   |
| Constant-lighting control           | Provided  | -   |
| Switching load at L´                | max. 1000 W   | max. 1000 W   |
| Supply current DALI-2               | 30mA guaranteed (15 ballasts), max. 250mA   | -   |
| IP rating                           | IP20  | IP20  |
| Protection class                    | I   | I   |
| Temperature range                   | -30°C to +65°C  | -30°C to +65°C  |
| Conformity                          | CE  | CE  |

### Technical diagram



- \* For illustration and description of remote control buttons → see "Remote controls"
- \*\* Absolute value for maximum reach depends on sensors → refer to "Sensor technical specifications"
- \*\*\* Percentage cannot be applied directly to energy consumption → see "light perception vs energy consumption"

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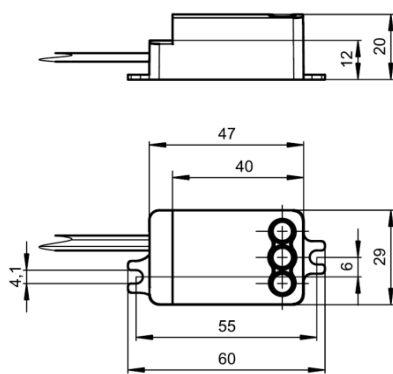
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### Sensor technical specifications

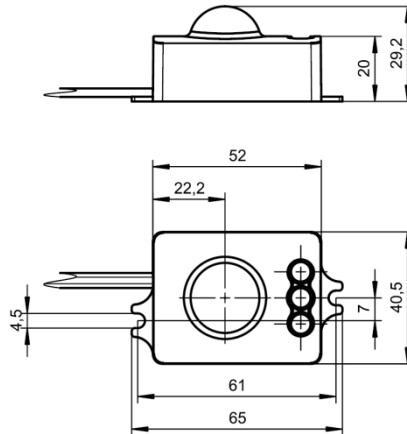
|                             | Sensor ED HF1   | Sensor ED HF2   | Sensor ED PIR  |
|-----------------------------|---|---|--|
| Type                        | 9004  | 9005  | 9003   |
| Dimensions                  | 47 × 29 × 20 mm<br>Hole spacing 55 mm<br>Cable length 450 mm                      | 52 × 40.5 × 29.2 mm<br>Hole spacing 61 mm<br>Cable length 450 mm                  | 46.4 × 20.4 × 18.5 mm<br>Hook spacing 35 mm<br>Cable length 450 mm               |
| Features                    | Motion detector<br>Light sensor<br>Feedback indicator for configuration interface | Motion detector<br>Light sensor<br>Feedback indicator for configuration interface | Motion detector<br>Light sensor<br>Feedback indicator<br>Configuration interface |
| Sensor technology           | High-frequency technology<br>Patch aerial   | High-frequency technology<br>Rod aerial   | Passive infrared technology  |
| Transmitter power           | 1 - 2 mW  | 1 - 2 mW  | -  |
| Transmission frequency      | 5.8 GHz   | 5.8 GHz   | -  |
| Light measurement range     | 2 - 2000 lx   | 2 - 2000 lx   | 2 - 2000 lx  |
| Angle of coverage           | 360° with 110° angle of aperture  | 360° with 160° angle of aperture  | 360° with 90° angle of aperture  |
| Detection zone for movement | At a mounting height of 5 m:<br>max. Ø 5 m  | At a mounting height of 4 m:<br>max. Ø 8 m  | At a mounting height of 3 m:<br>max. 6 × 6 m                                     |
| IP rating:                  | IP20  | IP20  | IP20   |
| Temperature range           | -20°C to +60°C  | -20°C to +60°C  | -20°C to +60°C   |
| Conformity                  | CE  | CE  | CE   |

### Technical diagrams

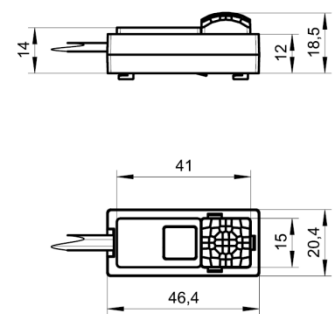
Sensor ED HF1



Sensor ED HF2

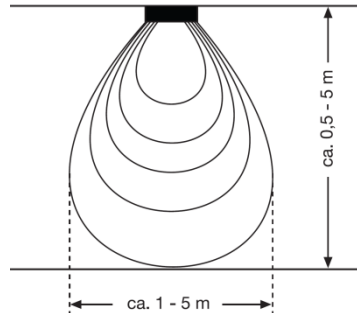


Sensor ED PIR

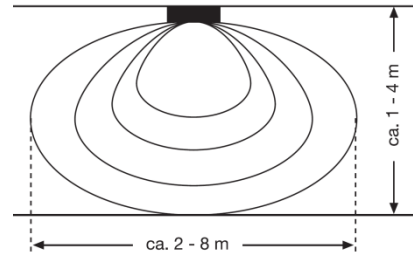


### Detection zones

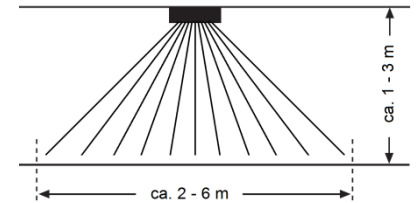
Sensor ED HF1



Sensor ED HF2



Sensor ED PIR

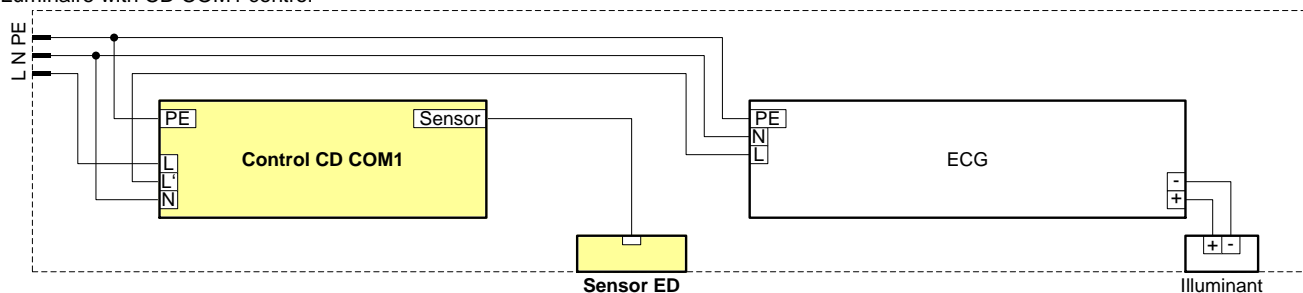


### Wiring

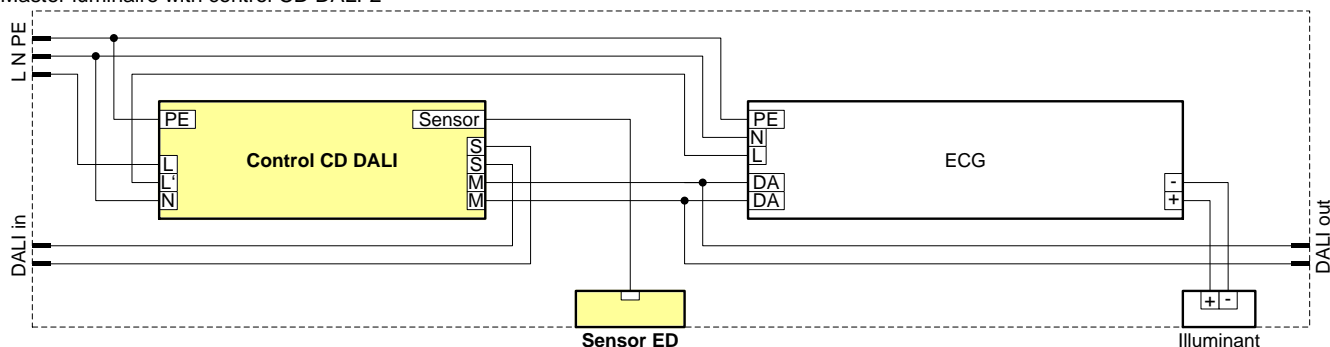
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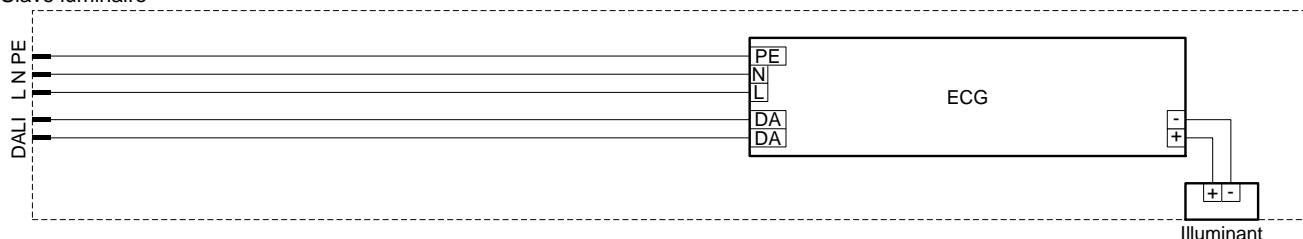
Luminaire with CD COM1 control



Master luminaire with control CD DALI-2



Slave luminaire



### Requirements on wiring protection

- Because the Sensor ED cable is not additionally insulated, the Control CD must be connected to protective earth.
- The protective earth for Control CD is connected to the housing via a serrated lock washer.
- All cables used inside luminaires must be rated for a nominal voltage of 300 VAC.

### Definition of terms

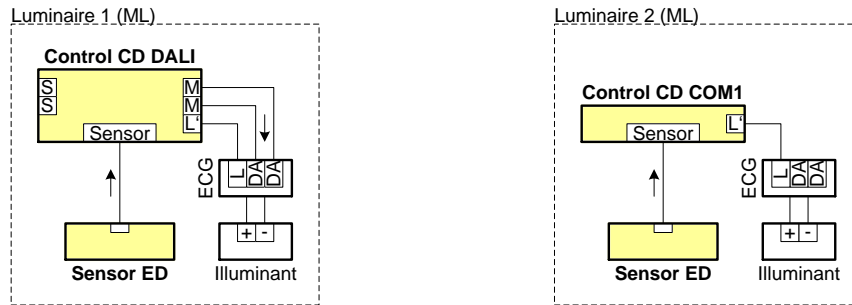
- A "slave luminaire" is a luminaire without a sensor.
- The "DALI-2 in" and "DALI-2 out" connections of the master luminaire are two separate DALI-2 units.

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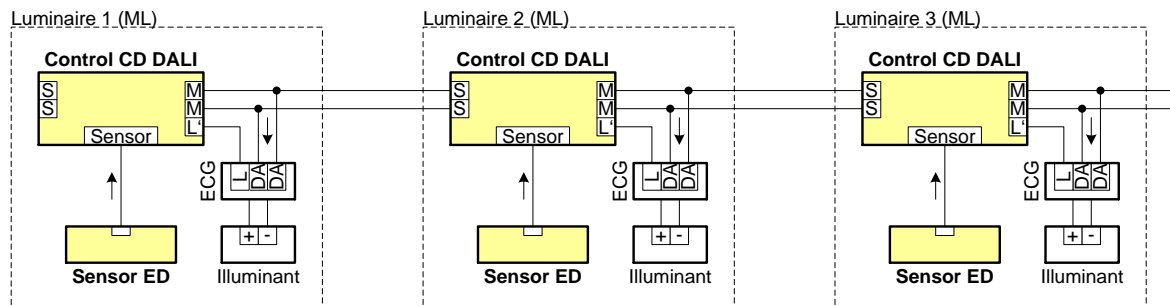
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### Applications

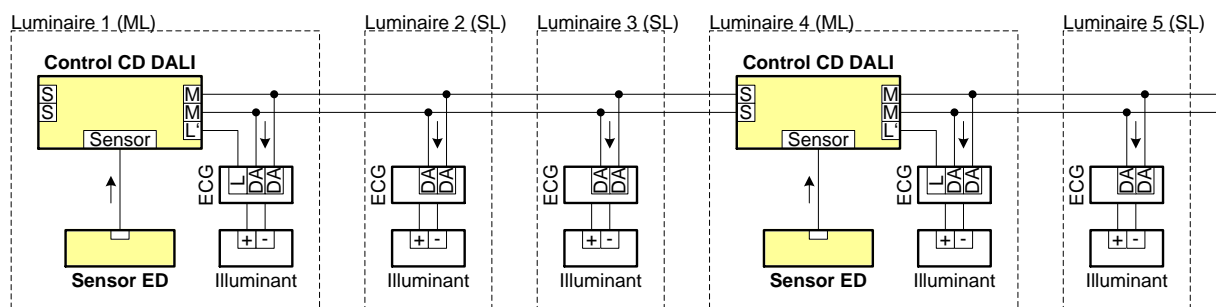
For the sake of clarity, the wiring diagrams below do not show the mains voltage power supply.



Option 1: the luminaires here are operated independently of each other.  
→ Applications: office, ceiling or wall luminaires



Option 2: interconnected luminaires are master luminaires only. No slave luminaires are used.  
→ Applications: conference room, multi-story car park, garage lighting



Option 3: strategically positioned master luminaires, remaining luminaires are slave luminaires.  
→ Applications: corridor, stairwell, garage lighting

### DALI-2 limitations

The DALI-2 bus does not provide system-wide communication but is interrupted at each master luminaire. This makes it possible to create networks.

A network comprises a master luminaire with sensors and 0 to 14 slave luminaires without sensors. Linking a maximum of 40 networks makes it possible to interconnect 40 x 15, i.e. 600 luminaires, per system.

### Safety precautions

- Electrical devices must only be assembled and installed by qualified electricians.

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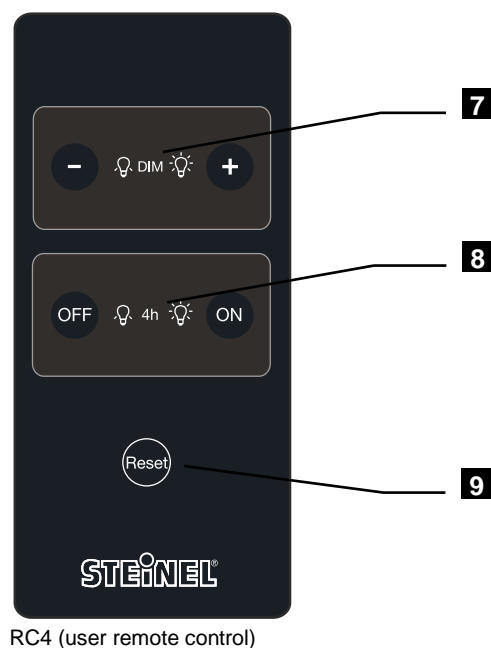
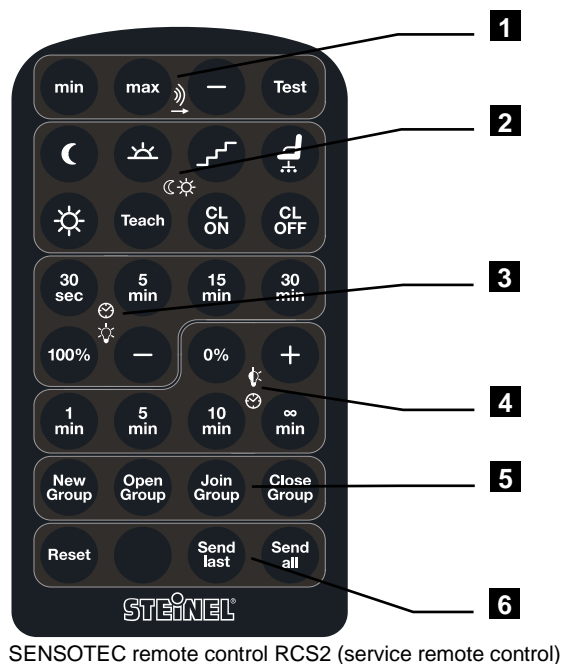
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- Fire hazard. The maximum permissible load must not be exceeded.
- Risk of electric shock. Disconnect before attempting work on the unit or load. Take into account all circuit breakers supplying dangerous voltages to the unit or load.
- Risk of electric shock. Before installing the sensor, check the enclosure to make sure it is not damaged. Never open the enclosure.
- Keep button cell batteries away from children. Immediately seek medical advice if button cell batteries are swallowed.
- Explosion hazard. Do not recharge batteries. Do not throw batteries into fire.
- The sensor is not suitable for use in burglar alarm systems or other alarm equipment.

### Installation advice

- For indoor use only.
- The sensor must project beyond the lamp. The angle of aperture must reach at least 45%.
- Pay attention to luminaire materials (interference, reflections, attenuation).
- The connected electronic ballast must not exceed the specifications at any time.

### Remote controls



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### Description of buttons / functions

#### 1 Reach setting / test mode

Reach can be set directly to minimum or maximum ("min, max" buttons) and, if necessary, reduced in 10% steps ("- " button). In test mode ("Test" button), reach can be checked with a shortened stay-ON time of 5 seconds. When selecting test mode, daylight operation is activated and basic light switched OFF. The mode is terminated manually by re-pressing the "Test" button, otherwise automatically after 2 minutes.

#### 2 Activation basis / constant-lighting control

When constant-lighting control is deactivated ("CL OFF" button), any movement / human presence will only switch the main light ON if ambient light is below the selected ambient light level thresholds ("moon, twilight, stairs, office" buttons, approx. 2, 40, 100, 300 lx). If the luminaire is currently providing basic light or if daylight operation is activated ("Sun" button), it switches directly to main light. It is also possible to teach in the current ambient light level ("Teach" button). If constant-lighting control is activated ("CL ON" button), specific light-level settings can be programmed for controlling lighting ("Moon, Twilight, Stairs, Office" buttons, approx. 500, 600, 700, 800 lx). Teaching brightness is more practical and provides greater precision. To do this, the chosen level of brightness must be selected via main light level or light adjustment before starting the teaching cycle ("Teach" button).

#### 3 Main light level / stay-ON time

The main light level can be set directly to maximum ("100%" button) and, if necessary, reduced in 5% steps ("- " button) down to a minimum main light level of 55%. The main light stay-ON times can be set to between 30 seconds and 30 minutes ("30 sec, 5 min, 15 min, 30 min" buttons). Main light is activated in response to movement if the activation condition is met. Once the stay-ON time has elapsed, the light returns to basic light (if this is activated) or the luminaire switches OFF if basic light is deactivated.

#### 4 Basic light level / stay-ON time

The basic light level can be set directly to minimum ("0%" button) and, if necessary, increased in 5% steps ("+" button) to a maximum basic light level of 45%. At 0% basic light, basic light is permanently deactivated. The basic light stay-ON times can be set to between 1 minute and 10 minutes ("1 min, 5 min, 10 min" buttons). It is also possible to activate basic light so that it stays on all the time ("∞ min" button).

#### 5 Grouping

In the factory setting, all devices belong to the same group. To remove a device from a group, it must be assigned to a new group ("New Group" button). As soon as this has been done, the group is opened. This is shown by the lamp switching ON at dimmed output. Further devices can now be added to the new group ("Join Group" button). It is also possible to open an existing group ("Open Group") to add further devices or also to indicate which devices belong to the group. Once luminaires have been grouped, grouping mode is closed manually ("Close Group" button) or terminated automatically after 2 min. Further grouping information and examples are provided in "Grouping networks".

#### 6 Parameter reset

If necessary, the current parameter set can be reset to factory settings ("Reset" button on RC control CD). It is also possible to send the entire parameter set ("Send all") or only the parameters last changed ("Send last" button) to the group's other devices.

#### 7 Light adjustment

If necessary, the current light level can be adjusted in 5% steps ("DIM +, -" buttons). The newly adopted value will be maintained until the next time the luminaire is switched ON/OFF.

#### 8 Override mode

Override mode ("4 h ON, OFF" buttons) deactivates normal sensor operation for 4 hours. When override mode is selected for permanent lighting, the luminaire permanently assumes the configured main-light level. Permanently OFF switches the luminaire OFF permanently and in spite of any movement activity. This, for example, is required during presentations. Light can also be adjusted in override mode.

#### 9 State reset

Although the user remote control is unable to clear parameters intentionally, it can be used to terminate the current operating state, return to sensor mode and assume the initial state = "no movement / light OFF" ("Reset" button on RC4 remote control).

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### Configuration procedure

Configuring systems must be planned before making settings on the devices. After drawing up a plan, it is recommended to follow this top-down procedure:

1. Pro System Complete grouping process.
2. Per group Activate / deactivate constant-lighting control, then program in or select luminaire reference.
3. Per luminaire Configure main light / basic light level / reach, if necessary by pressing "Send last" button to synchronise via group.

### Feedback indicator flash pattern

|                           | Meaning        | Application   |
|---------------------------|----------------|---|
| Short flash (1 x 100 ms)  | "Confirmation" | Remote control command successfully processed   |
| Double flash (2 x 100 ms) | "Completed"    | State has been reset / grouping mode terminated / teach cycle completed / test mode terminated  |
| Triple flash (3 x 100 ms) | "Reset"        | Parameters have been reset  |
| Long flash (1 x 700 ms)   | "Fault"        | No unused group code available / maximum basic light already reached / minimum main light already reached / minimum reach already reached |

### Relationship between power consumption and light perception

Light level is selected on the basis of the way in which it is perceived. The following table of values shows the relationship between possible basic / main light settings and the relative output in percent.

| Basic light level setting | Relative output | Main light setting | Relative output |
|---------------------------|-----------------|--------------------|-----------------|
| 0%                        | 0.0%            | 55%                | 11%             |
| 5%                        | 1.0%            | 60%                | 15%             |
| 10%                       | 1.3%            | 65%                | 18%             |
| 15%                       | 1.7%            | 70%                | 24%             |
| 20%                       | 2.2%            | 75%                | 29%             |
| 25%                       | 2.7%            | 80%                | 38%             |
| 30%                       | 3.5%            | 85%                | 48%             |
| 35%                       | 4.3%            | 90%                | 61%             |
| 40%                       | 5.7%            | 95%                | 76%             |
| 45%                       | 7.1%            | 100%               | 100%            |

### Factory settings

|                           | Control CD DALI-2         | Control CD COM1           |
|---------------------------|---------------------------|---------------------------|
| Reach                     | 100%                      | 100%                      |
| Switch-ON threshold       | none (daylight operation) | none (daylight operation) |
| Constant-lighting control | deactivated               | -                         |
| Main light level          | 100%                      | -                         |
| Main light stay-ON time   | 5min                      | 5min                      |
| Basic light level         | 10%                       | -                         |
| Basic light stay-ON time  | 10 min                    | -                         |
| Group code                | Group 0                   | -                         |

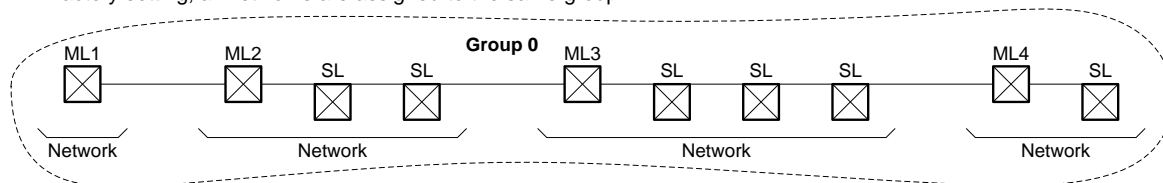


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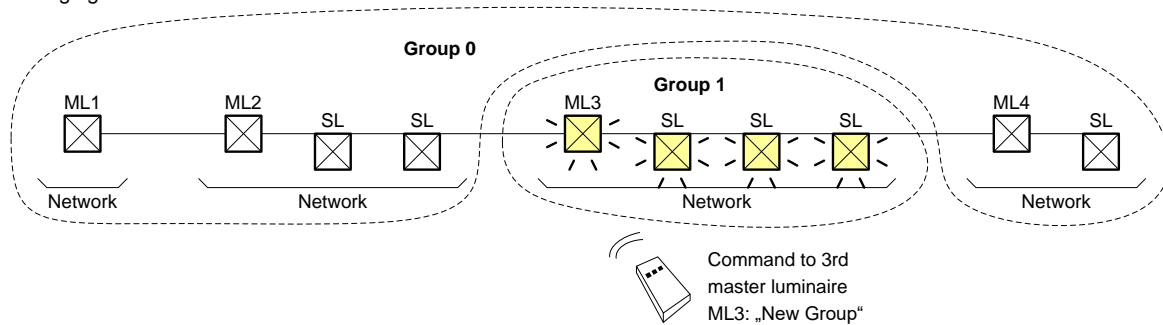
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### Grouping networks

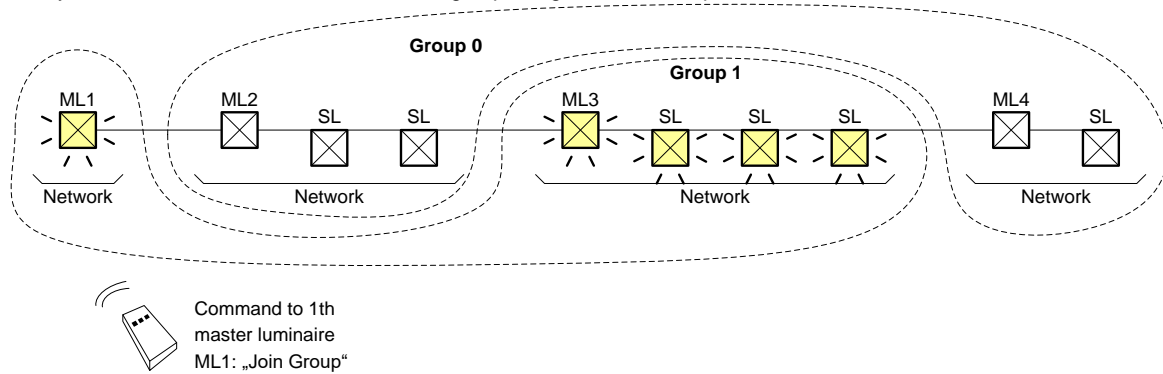
❶ In factory setting, all networks are assigned to the same group.



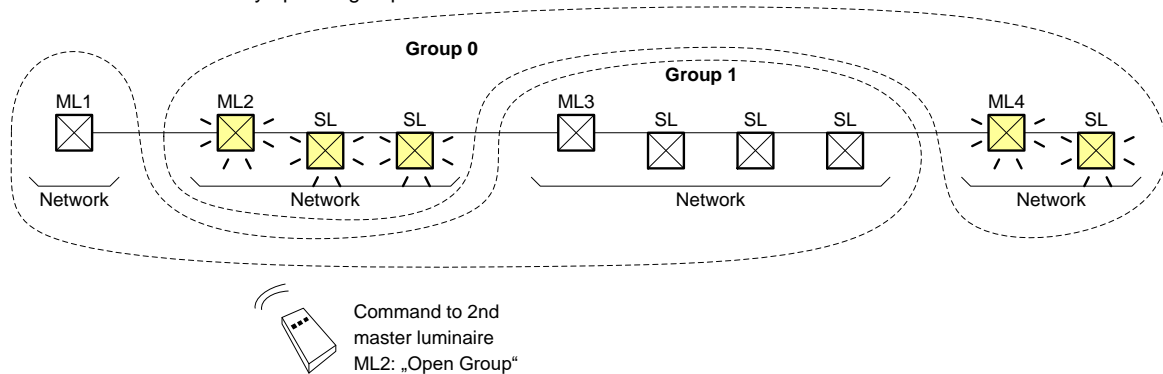
❷ Pressing the "New Group" button disconnects a network from the group it has so far belonged to. It is assigned a group of its own. At the same time, this group is now opened and identified by dimming the lights belonging to it.



❸ Any networks can now be added to the new group using the "Join Group" button.



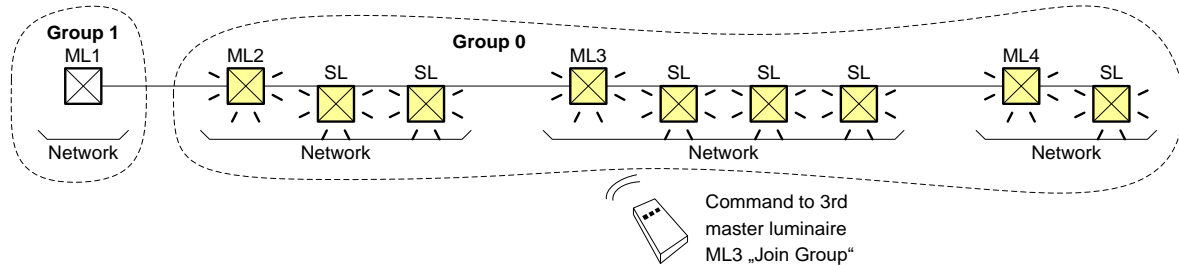
❹ Any other group can be opened using the "Open Group" button. Group identification is now updated: The luminaires in the newly opened group are switched ON.



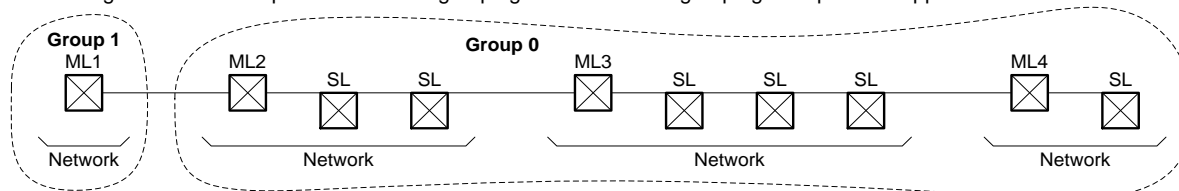
❺ The "Join Group" button can now be used again to assign networks.

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⑥ Pressing the "Close Group" terminates the grouping mode. The new grouping set-up is now applied.



### Conformity / marks of conformity



### Note

As attenuation and reflections can cause a high-frequency sensor to behave differently in any luminaire, we cannot accept any liability for the sensor not working as expected in the particular luminaire it is being used in. However, we are able to provide accreditation. Please contact our OEM Account Manager to find out what assistance we can give you in designing the sensor module into a luminaire. The customer must also guarantee and take responsibility for the way in which the other components behave in the luminaire (lamp, ballast etc.).

This product data sheet provides no guarantee of qualities within the meaning of the statutory warranty provisions for the product described.