

Light-dependent Control

The **light-dependent control** reduces the brightness of illuminated advertising signs during the night (night-time dimming). There are two good reasons for a reduced brightness at night:

1. Energy savings

Reduced brightness means reduced power consumption, i.e. less energy is required. This may translate to a cost reduction of up to 30%.

2. Better legibility

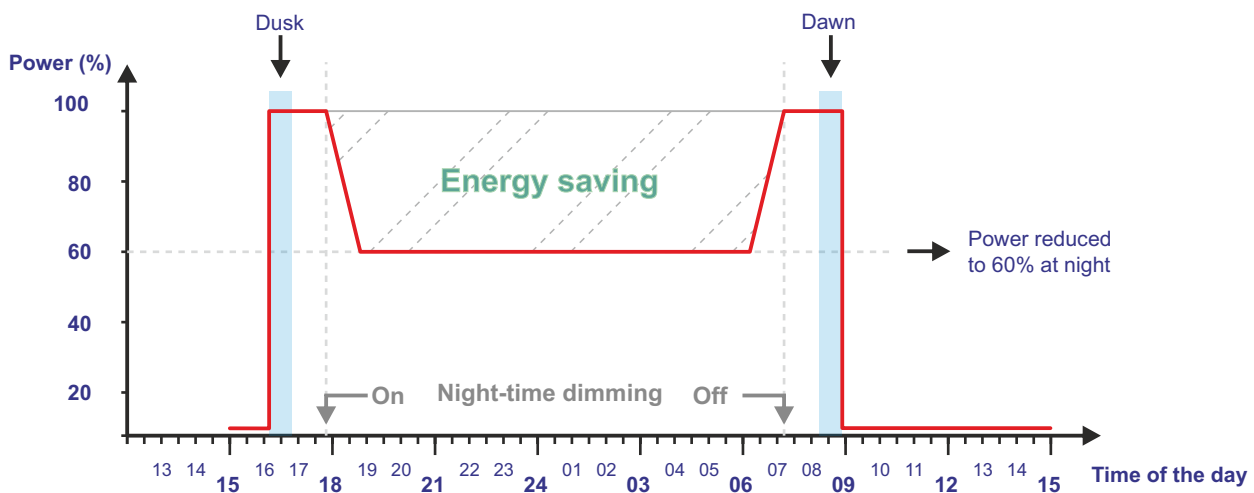
The brightness contrast between the illuminated sign and the environment is very different at daytime, twilight and nighttime.

At twilight, an illuminated advertising sign must shine bright to stand out against the relatively bright environment. At night, the same sign appears much brighter because the environment has become darker.

Such "outshining" signs are difficult to recognize, particularly when blue surfaces are involved. Night-time dimming prevents this outshining effect and enhances legibility.

The **hansen** light-dependent controllers are solely controlled by the ambient light. They are able to adapt to the different levels of residual brightness at night created, for example, by street lighting or other advertising signs. For example, a rural surrounding will be darker than a busy urban area.

Power consumption of an illuminated advertising sign with night-time dimming in the winter (21 December)



The above diagram shows the power consumption of an illuminated advertising sign over the course of a day:

- During daytime, the sign remains switched off.
- When dusk falls (here at 4:00 pm), the sign is switched on with full brightness.
- After dusk, the brightness is reduced to approx. 60%.
- This reduced brightness level is maintained throughout the night until the break of dawn.
- When dawn breaks, the sign starts to shine brighter.
- When the normal daylight level is reached, the sign is switched off.

Light-dependent Controller for DIN Rail Mounting

Article no. 5 1201 130

The light-dependent control system (TM) consists of:

1. the controller in a DIN rail housing
2. the light sensor

Controller

The controller is designed for DIN rail mounting and features connecting terminals for the operating voltage, sensor cables and control cables. The controller settings can be adapted via four push-buttons on the housing.

Light sensor

The light sensor is a small electronic component (see picture on the right) which is sensitive to natural and artificial light. The sensor is hermetically sealed in a plastic housing and provided with a **2 m** four-core connecting cable.

Operational behaviour

The controller supplies a voltage of 0–10 V at the output (terminals 1–4). This voltage can be used to dim electronic converters.

The magnitude of the voltage depends on:

- the ambient light level
- the controller settings

Independent of the light sensor, the controller can also be used as a permanent dimmer.

Installation and positioning

The controller can be installed in converter boxes, converter cabinets or electrical distribution boards. The cable length between the controller and the light sensor must not exceed 100 m when using a shielded network cable.

Limit values:

- | |
|---|
| • Max. connectable number of converters: 50 (distributed over all channels) |
| • Maximum 0–10 V control cable length: |
| Between controller and converters: approx. 10 m |
| - with shielded cable (Cat 7): approx. 20 m |
| • Max. sensor cable length: |
| - with shielded cable (Cat 7): approx. 100 m |

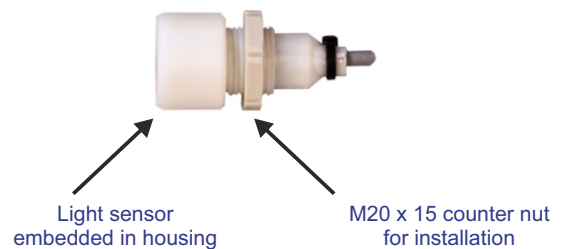
Controller



Dimensions:
90 x 72 x 60 mm



Light sensor



Installing the light sensor

The light sensor should be installed in such a way that direct exposure to a light source is avoided and an unobstructed view towards the sky is ensured.

Light-dependent Controller for DIN Rail Mounting

Article no. 5 1201 130

Using the “Mode” button, the following modes can be selected:

Lux mode:

This mode will switch and dim the light automatically as described on page 1.

- Using the “Select” button, the following settings can be changed:

- **Schwelle (Threshold)** [Einschaltswelle/switch-on threshold*]

0 lux = dark

600 lux = bright (When the threshold is set to 600, the system remains permanently switched on.)

*The designation in square brackets denotes the similar setting in the previous controller version.

- **Tag Zustand (Day Status)**

Defines whether the light should be switched on or off at daytime.

- **Min. Licht 1–4 (Min. Light 1–4)** (minimum brightness of the outputs 1–4)

Defines the lower limit for the dimming.

- **Max. Licht 1–4 (Max. Light 1–4)** (brightness limitation of the outputs 1–4)

Defines the upper limit for the dimming.

This setting applies to all modes.

Manuell (Manual) mode:

- The buttons “<<” and “>>” can be used to set a fixed brightness level.

The brightness sensor will be ignored.

Slave mode:

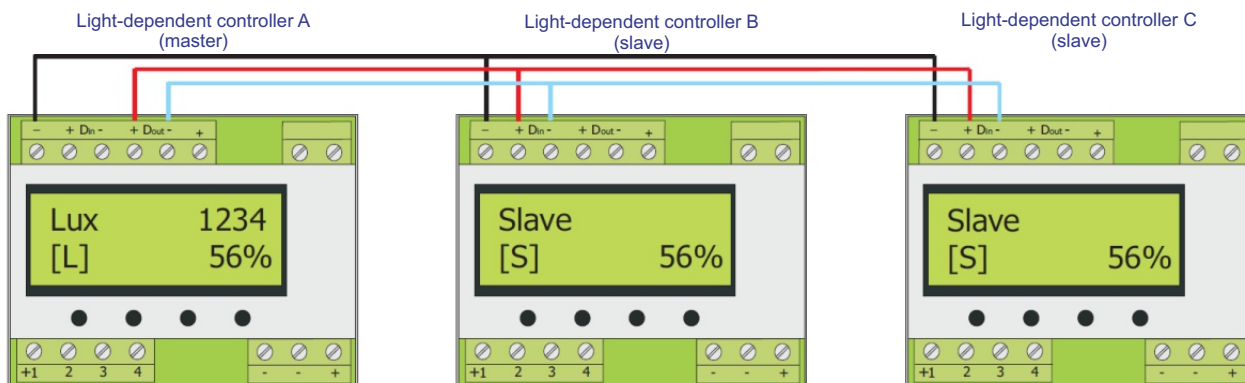
In this mode, the controller will operate as slave following the settings selected on the connected master (see description below).

Slave mode and master/slave principle:

The master/slave principle allows multiple light-dependent controllers to be connected with each other, all reacting to one light sensor. In the below example, **controller A** serves as the master and defines the output voltage for all the other controllers (slaves). For this purpose, the “Slave” mode must be selected on all the slave modules. Instead of the light-dependent controllers, other products compatible with the “Toni Maroni LED protocol” can also be connected as slaves.

The connection between the controllers and the sensor should be made with a Cat 5 network cable, which allows distances of up to 100 m to be bridged. If a slave indicates “No data”, the data cable must be checked. For very long distances, a slave can be used as signal amplifier using the “D_{out}” terminal to connect the downstream slaves.

The following diagram illustrates the master/slave principle:

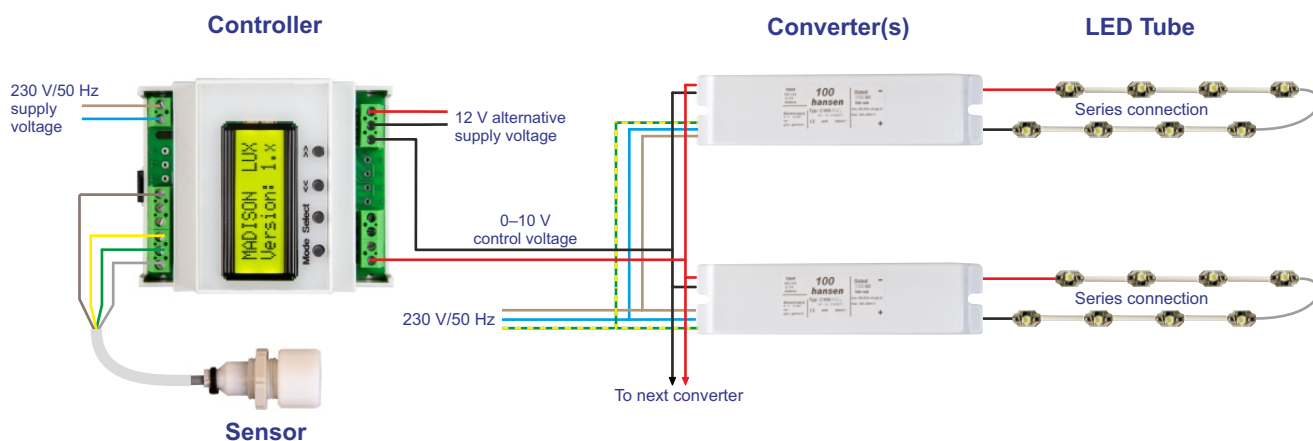


Length of the control cable: We recommend the keep the 0–10 V control cable at a maximum length of 10 m. Although longer cables may be used, the risk of the signal being affected by interfering electric fields increases with the length of the cable. Hence, the maximum usable cable length strongly depends on the ambient factors.

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Connection scheme for LEDs in series connection



Connection scheme for LEDs in parallel connection

