

Light-dependent Controller with Timer for DIN Rail Mounting

Article no. 5 1201 131

Functional principle

The light-dependent controller with timer is designed to dim and switch illuminated advertising signs depending on the ambient daylight level. This helps to reduce the energy consumption while extending the lifetime of the installation.

At dusk, the sign is switched on when a defined minimum ambient brightness level (lux value) is reached. With increasing darkness, the brightness of the sign is reduced. With increasing ambient brightness in the morning, the brightness of the sign is increased until the sign is switched off when a defined ambient brightness level is reached (optionally, the sign can remain switched on).

Alternatively, the sign can be switched on and off by the integrated clock/timer with weekly program function.

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 changed via four push-buttons on the housing.

Light sensor

The light sensor is a small electronic component (see bottom 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 0–10V 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.

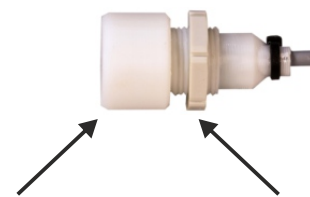
Installation and positioning

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.

Controller



Light sensor



Light sensor embedded in housing

M20 x 15 counter nut for installation

Installing the light sensor

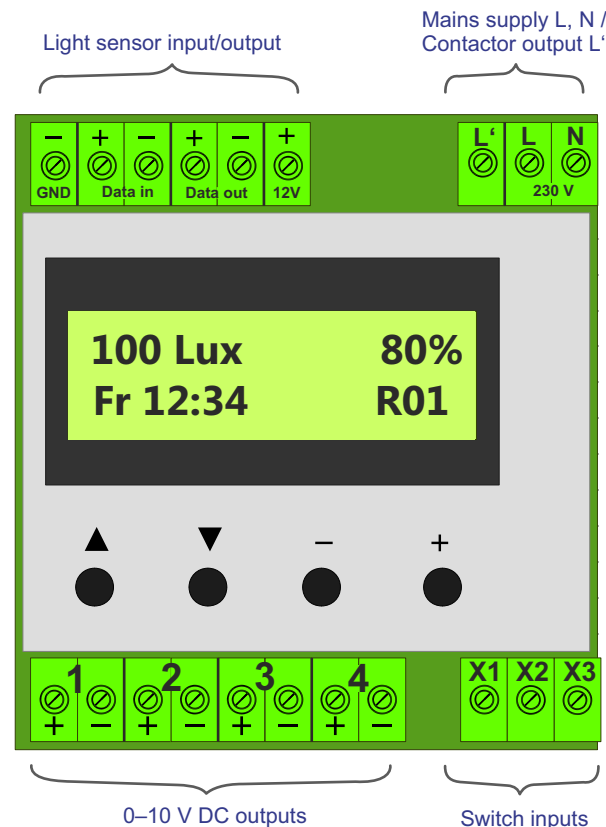
The light sensor should be installed in such a way that direct exposure to a light source is avoided and an unobstructed view towards the sky is ensured.

Light-dependent Controller with Timer for DIN Rail Mounting

Article no. 5 1201 131

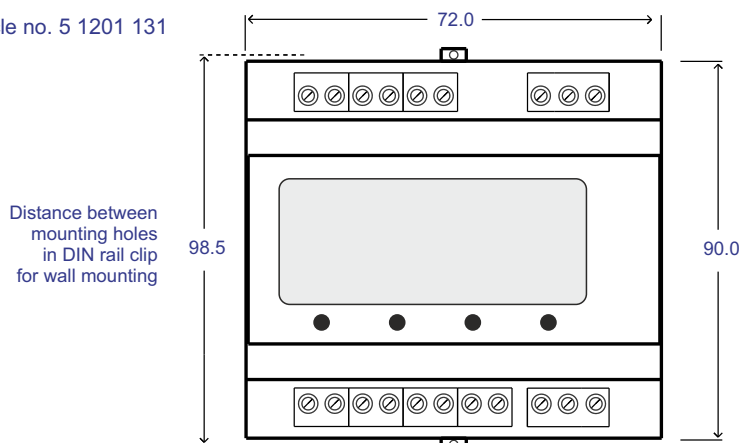
General data:	
Degree of protection	IP20
Protection class	II
Conformity	CE
Operating temperature	-25 °C to +65 °C
Article number	5 1201 131
Electrical data:	
Input voltage	180–230 V (+/- 10%) 50/60 Hz
Current consumption	max. 0.05 A
Output voltage 1–4	0–10 V DC
Output current 1–4	max. 35 mA (max. 50 converters)
Switching capacity L'	max. 100 mA (23 W)
Light sensor cable length	max. 100 m
Light sensor measuring range	1–600 lx
Input protection fuse	yes
Galvanic isolation	yes
Short-circuit protection	yes
Mechanical data:	
Weight	240 g
Housing material	polycarbonate
Fire protection class	UL94-V0
Size (L x W x H)	72 x 90 x 60 mm
Housing colour	grey

All values refer to an ambient temperature of +25 °C.



Housing dimensions:

Article no. 5 1201 131

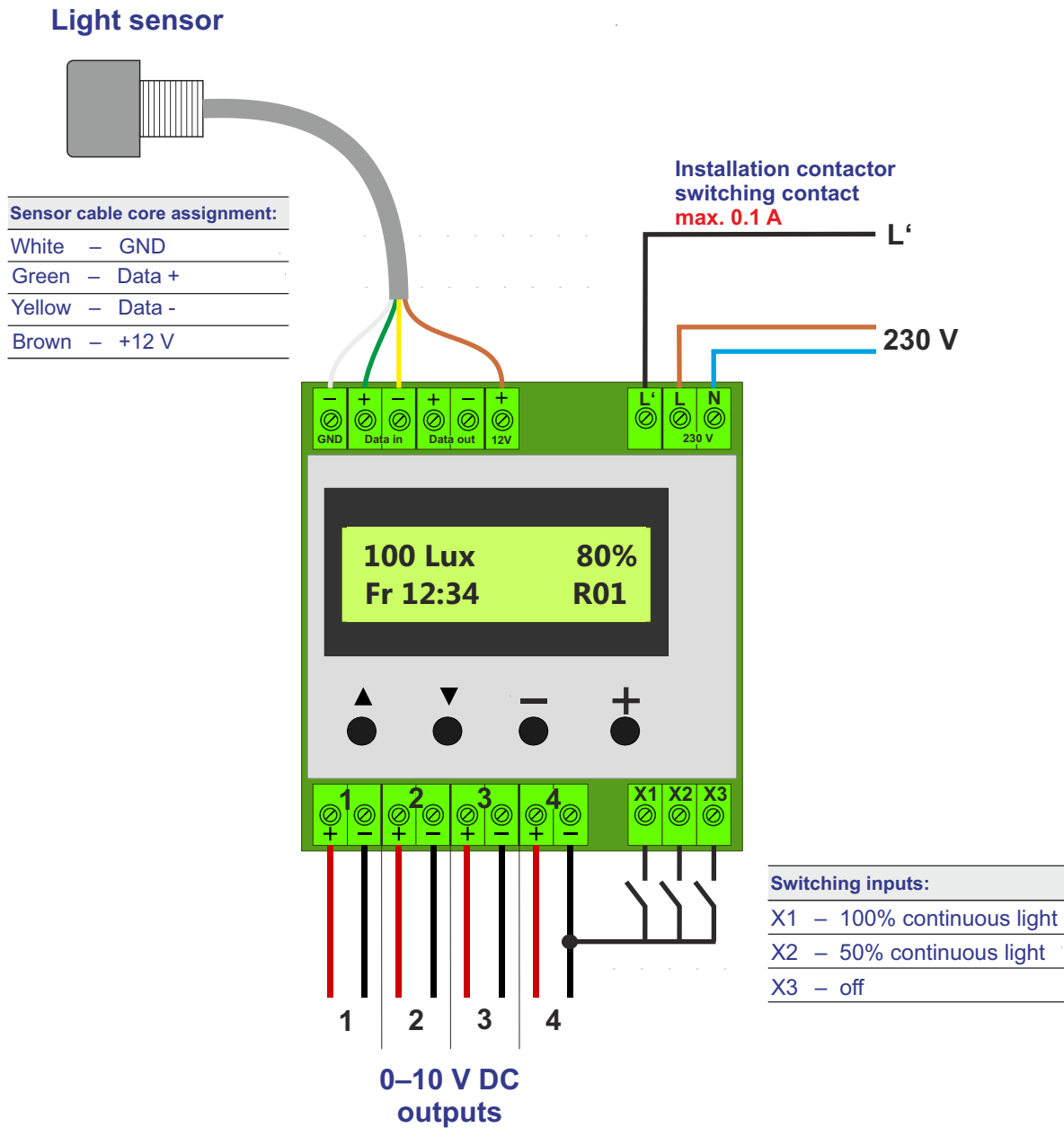


Housing colour: grey
All dimensions in millimetres



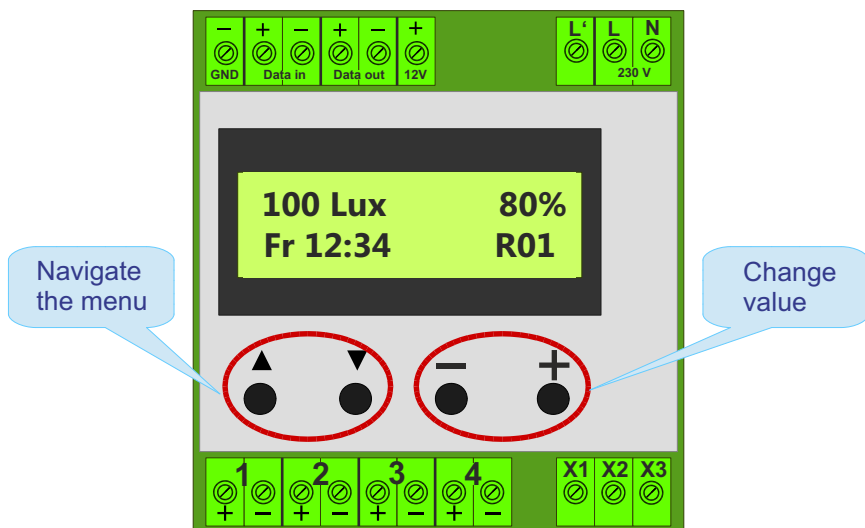
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Article no. 5 1201 131



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Light sensor settings (guide values):	
5 lx	- Night
10 lx	- Beginning night
45 lx	- Advanced twilight
85 lx	- Beginning twilight *
100 lx	- Beginning evening
250 lx	- Slight twilight

* Pre-set standard value

Setting the main functions

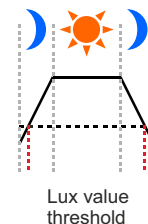


Automatic operation
The first line shows the current lux value from the light sensor (sluggish behaviour) and the current brightness value of the sign (in percent). The second line shows (if active) the current time and the currently active switching program (rule) for the system. If the display shows R--, no rule has been activated yet.

Continuous light
When activating this menu, the sign is switched on permanently with the selected brightness (here 20%). Use the + / - buttons to select the desired value. All other functions remain inactive.

Switch-on and switch-off threshold
When the ambient brightness falls below the selected lux value, automatic dimming is activated. When the threshold is exceeded, it can be defined whether the sign is to remain switched on or off (day status).

Day status
EIN (on): The sign remains switched on during daytime.
AUS (off): The output voltage is reduced to 0% or the system is switched off completely by the relay (L') respectively.



Light-dependent Controller with Timer for DIN Rail Mounting

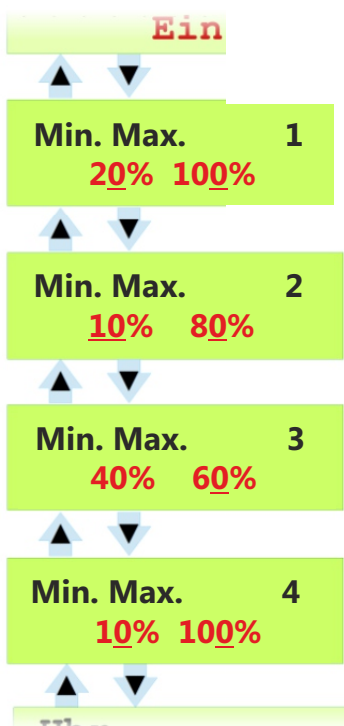
Setting the dimming range



Dimming range

The controller has four outputs, which can be adjusted individually with respect to the dimming range (setting "Einzel"). This allows brightness differences within the sign to be compensated for.

Individual settings ("Einzel")



Settings for output 1

A dimming range between 0 and 100% can be defined for output 1. We recommend starting the dimming range with a min. value of 10% to avoid possible flickering of the sign.

Settings for output 2

A dimming range between 0 and 100% can be defined for output 2. We recommend starting the dimming range with a min. value of 10% to avoid possible flickering of the sign.

Settings for output 3

A dimming range between 0 and 100% can be defined for output 3. We recommend starting the dimming range with a min. value of 10% to avoid possible flickering of the sign.

Settings for output 4

A dimming range between 0 and 100% can be defined for output 4. We recommend starting the dimming range with a min. value of 10% to avoid possible flickering of the sign.

Common settings ("Gemeinsam")



Common settings for all outputs

Alternatively to the individual settings, a common dimming range between 0 and 100% can be defined for all outputs (setting "Gemeinsam"). We recommend starting the dimming range with min. value of 10% to avoid possible flickering of the sign.

Light-dependent Controller with Timer for DIN Rail Mounting

Setting the time/date



Timer/clock function
The controller has an internal clock, which can be used to activate a weekly program. When set to "Aus" (off), this function is deactivated.

Internal clock on
Selecting "Uhr Intern – An" (internal clock on) activates the internal clock. A date and an associated weekly program can now be set.

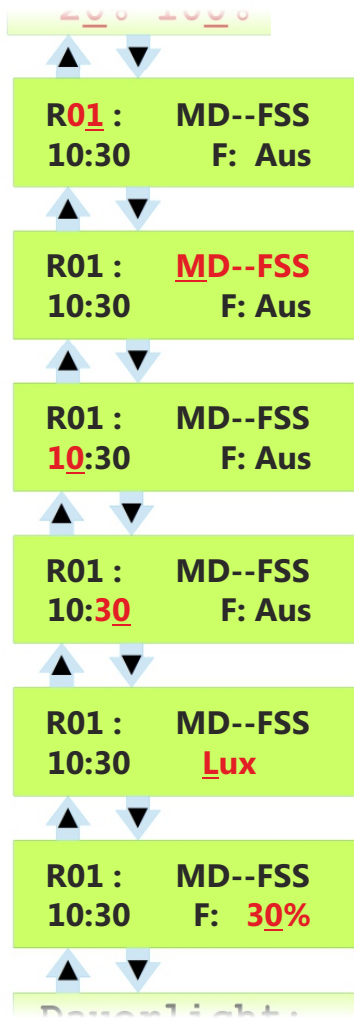
External clock on
This function is needed when operating multiple light-dependent controllers in slave mode. When this function is activated, each slave controller adopts the time and date from the master controller.

Date
Sets the date to determine the current day of the week.

Automatic daylight saving time
When set to "An" (on), the timer automatically changes to daylight saving time and back to standard time. When set to "Aus" (off), no automatic adjustment will take place.

Light-dependent Controller with Timer for DIN Rail Mounting

Setting the a weekly program



Rules (program number)
Up to 16 different rules (programs) can be defined (R01–R16).

Day of the week
Defines the day(s) of the week on which the selected rule shall be active. Letter (e.g. M = Monday) shown = active / - (minus) shown = inactive. To deactivate a rule, all days of the week must be set to (-).

Hour
Defines the hour at which the selected rule shall become active.

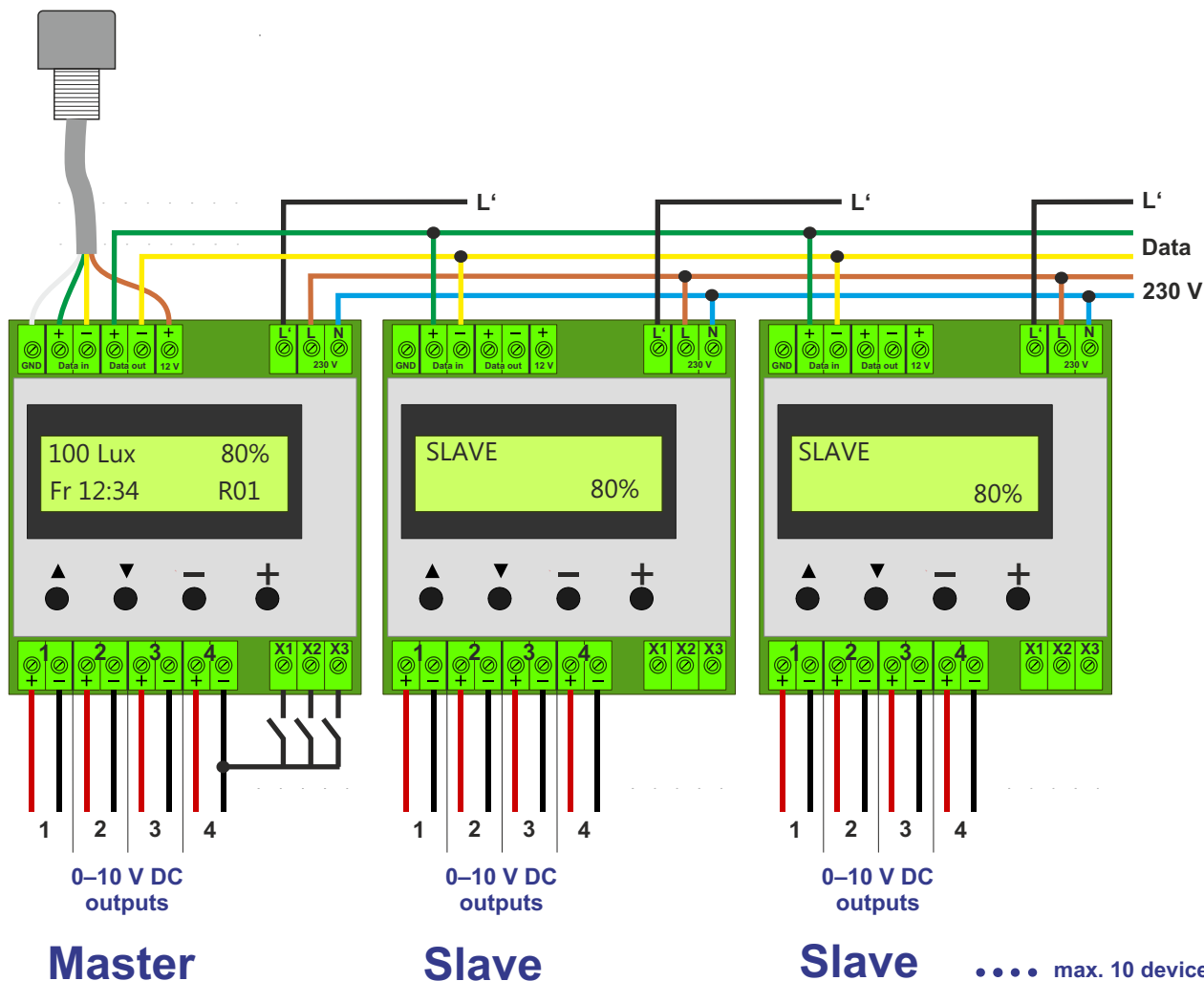
Minute
Defines the minute at which the selected rule shall become active.

Type of dimming
Defines what should happen with the sign at the selected time:

- F: Aus – Sign is switched off
- F: 1–100% – Sign shines with fixed brightness (adjustable between 1 and 100%)
- Lux – Automatic dimming is active

Light-dependent Controller with Timer for DIN Rail Mounting

Light sensor



Settings:

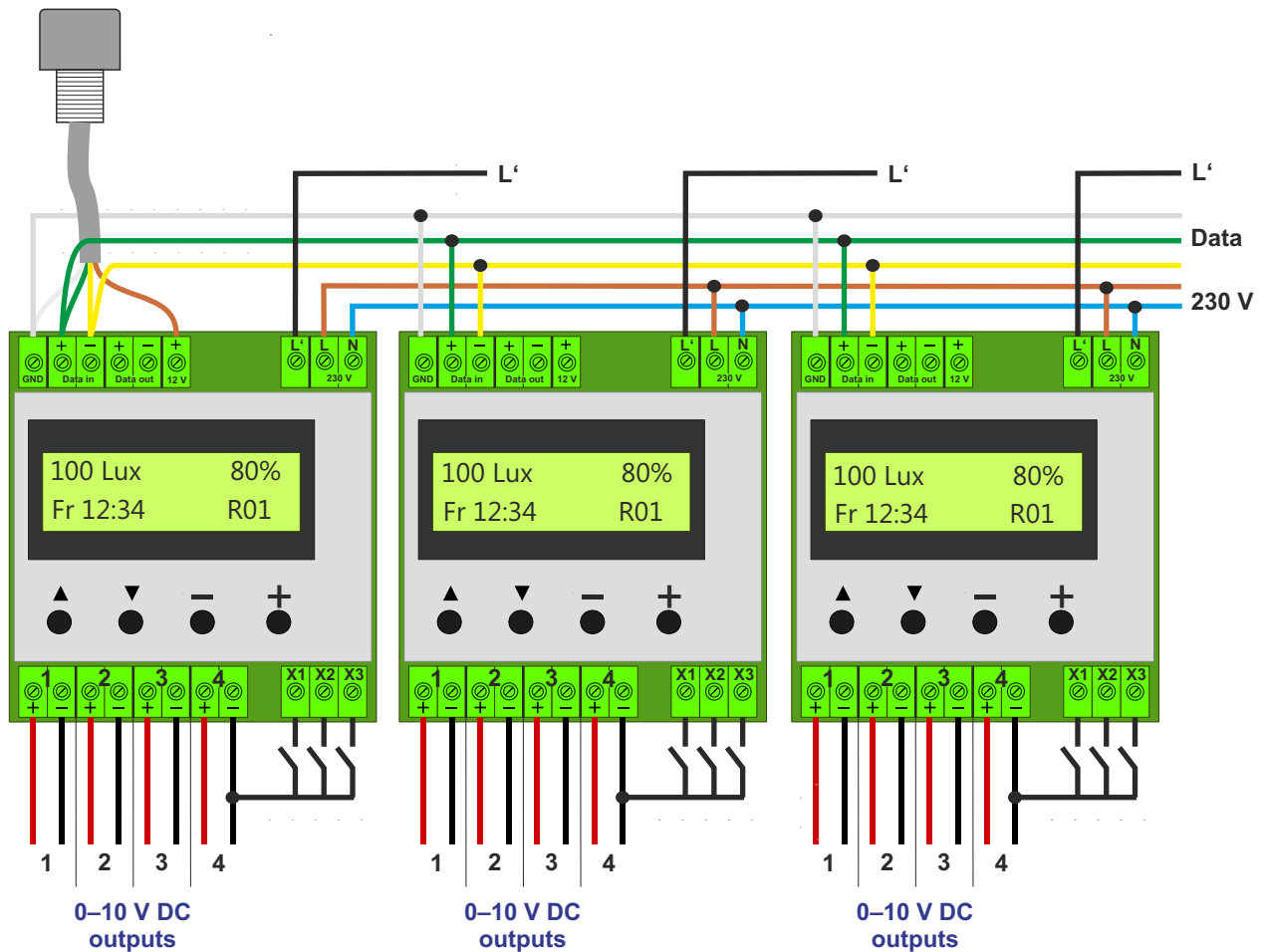
To change from master to slave mode:
Press buttons ▲ + ▼ for 3 seconds.

All devices in “slave” mode use the settings defined for the “master”.
One “master” can control up to 10 “slave” modules.

When the display shows “Slave keine Daten” (slave no data), the data connection is faulty.

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Light sensor



•••• max. 10 devices

Settings:

All controllers are individually adjustable and use a common input value from the light sensor. The current time and date is adopted from the master controller. For this purpose, the function "Uhr Extern An" (external clock on) must be selected on all slave modules (see page 6).