

Driver LC 13W 50-300mA bDW NF SR PRE4 premium series



Product description

- _ lumDATA (DALI-2 part ext. 251, 252 and 253)
- _ Can be integrated in Casambi systems (Casambi Ready)
- _ Forms automatically a wireless communication network with up to 250 nodes
- _ Independent dimmable constant current LED driver with strain-relief
- _ Dimming range 1 to 100 % (min. 3.0 mA)
- _ Max. output power 12.5 W
- _ Nominal lifetime up to 100,000 h
- _ 5 years guarantee (Conditions at <https://www.tridonic.com/en/int/services/manufacturer-guarantee-conditions>)
- _ We will provide security updates for the next five years after the date of purchase of this product

Housing properties

- _ Casing: makrolon, white
- _ Type of protection IP20
- _ Strain relief with loop through function

Interfaces

- _ Near field communication (NFC)
- _ basicDIM Wireless
- _ Terminal blocks: 0° / 45° push terminals (input / output)

Functions

- _ Adjustable output current in 1-mA-steps (NFC)
- _ Support NFC multiple programming (full carton box)
- _ Fulfills DALI-2 parts: 105 (DALI firmware update), 251 (Luminaire data), 252 (Energy reporting) and 253 (Diagnostics & Maintenance)
- _ Constant light output function (eCLO)
- _ Power-up fading at AC
- _ Switch off the driver with fade2zero
- _ Service monitor to log certain events
- _ LTI (Lifetime Indicator)
- _ Protective features (overtemperature, short-circuit, overload, no-load, input voltage range)
- _ Suitable for emergency escape lighting systems acc. to EN 50172
- _ For cable cross-sections up to 2.5 mm²

Benefits

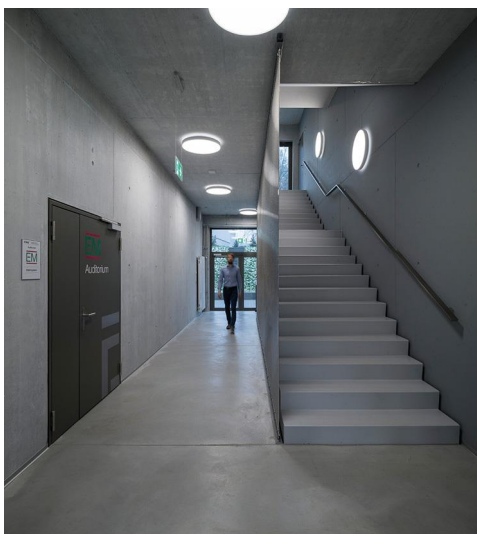
- _ Application-oriented operating window for maximum compatibility
- _ Best energy savings due to low stand-by losses and high efficiency
- _ Flexible configuration via companionSUITE
- _ No tools required for installation

Typical applications

- _ For downlight, spotlight and decorative applications

Website

<http://www.tridonic.com/28005482>



Linear



High bay



Decorative



Downlights



Spotlights



Free-standing



Area

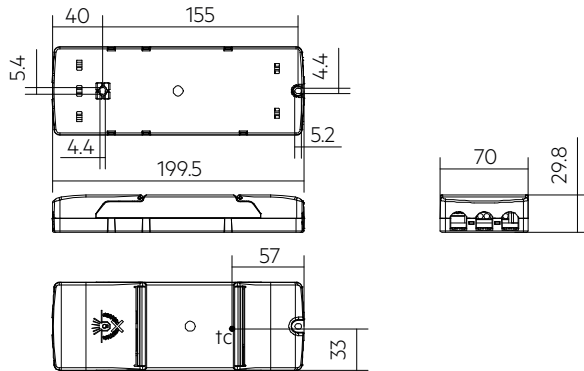


Floor | Wall



Street

Driver LC 13W 50-300mA bDW NF SR PRE4
premium series

**Ordering data**

Type	Article number	Packaging, carton	Packaging, pallet	Weight per pc.
LC 13/50-300/54 bDW NF SR PRE4	28005482	10 pc(s).	600 pc(s).	0.196 kg

Technical data

Rated supply voltage	220 – 240 V
AC voltage range	198 – 264 V
DC voltage range	176 – 280 V
Mains frequency	0 / 50 / 60 Hz
Overvoltage protection	320 V AC, 48 h
Typ. rated current (at 230 V, 50 Hz, full load) ^{①②}	70 mA
Typ. current (220 V, 0 Hz, full load, EOFx dimlevel) ^③	20 mA
Max. input power	15.4 W
Output power range (P _{rated})	0.5 – 12.5 W
Typ. efficiency (at 230 V, 50 Hz, full load) ^④	82 %
λ over full operating range (max.)	0.97
λ over full operating range (min.)	0.26C
Typ. power consumption on stand-by	< 0.26 W
Typ. input current in no-load operation	17.4 mA
Typ. input power in no-load operation	0.42 W
In-rush current (peak / duration)	36.4 A / 128 μs
THD (at 230 V, 50 Hz, full load) ^①	< 7 %
Starting time (AC mode)	< 0.7 s
Starting time (DC mode)	< 0.35 s
Switchover time (AC/DC) ^③	< 0.11 s
Turn off time (at 230 V, 50 Hz, full load)	< 20 ms
Output current tolerance ^{①⑤}	± 5 %
Max. output current peak (non-repetitive)	450 mA
Output LF current ripple (< 120 Hz)	± 5 %
Output P _{ST_LM} (at full load)	≤ 1
Output SVM (at full load)	≤ 0.4
Max. output voltage (U-OUT)	60 V
Dimming range	1 – 100 % (min. 3.0 mA)
Mains surge capability (between L - N)	1 kV
Mains surge capability (between L/N - PE)	2 kV
Type of protection	IP20
Radio transceiver operating frequencies	2.4 – 2.483 GHz
Max. output power radio transceiver (E.I. R.P.) ^⑥	< + 20 dBm
Radio protocol	Bluetooth 4.0 or 5.0 Low Energy (BLE)
Capable for mesh network	Up to 250 nodes / Standard networks and Long Range
Lifetime	up to 100,000 h
Guarantee (conditions at www.tridonic.com)	5 Year(s)
Dimensions L x W x H	200 x 70 x 30 mm

Approval marks**Standards**

EN 55015, EN 61000-3-2, EN 61000-3-3, EN 61000-4-4, EN 61000-4-5, EN 61347-1, EN 61347-2-13, EN 61547, EN 62384, ETSI EN 300 330, ETSI EN 301 489-1, ETSI EN 300 328, ETSI EN 301 489-17, according to EN 50172, according to EN 60598-2-22

Specific technical data

Type	Output current ^④	Min. output voltage	Max. output voltage	Max. output power	Typ. power consumption n (at 230 V, 50 Hz, full load)	Typ. current consumption n (at 230 V, 50 Hz, full load)	T _c point max.	Ambient temperature T _a
LC 13/50-300/54 bDW NF SR PRE4	50 mA	10 V	54.0 V	2.7 W	5.5 W	35 mA	89 °C	-20 ... +70 °C
LC 13/50-300/54 bDW NF SR PRE4	75 mA	10 V	54.0 V	4.0 W	6.8 W	38 mA	84 °C	-20 ... +65 °C
LC 13/50-300/54 bDW NF SR PRE4	100 mA	10 V	54.0 V	5.4 W	8.2 W	41 mA	84 °C	-20 ... +65 °C
LC 13/50-300/54 bDW NF SR PRE4	125 mA	10 V	54.0 V	6.8 W	9.6 W	47 mA	85 °C	-20 ... +65 °C
LC 13/50-300/54 bDW NF SR PRE4	150 mA	10 V	54.0 V	8.1 W	10.9 W	52 mA	85 °C	-20 ... +65 °C
LC 13/50-300/54 bDW NF SR PRE4	175 mA	10 V	54.0 V	9.4 W	12.3 W	57 mA	85 °C	-20 ... +65 °C
LC 13/50-300/54 bDW NF SR PRE4	200 mA	10 V	54.0 V	10.8 W	13.7 W	63 mA	85 °C	-20 ... +65 °C
LC 13/50-300/54 bDW NF SR PRE4	225 mA	10 V	54.0 V	12.2 W	15.0 W	69 mA	85 °C	-20 ... +65 °C
LC 13/50-300/54 bDW NF SR PRE4	231 mA	10 V	54.0 V	12.5 W	15.4 W	70 mA	85 °C	-20 ... +65 °C
LC 13/50-300/54 bDW NF SR PRE4	250 mA	10 V	50.0 V	12.5 W	15.4 W	70 mA	88 °C	-20 ... +70 °C
LC 13/50-300/54 bDW NF SR PRE4	275 mA	10 V	45.5 V	12.5 W	15.3 W	70 mA	88 °C	-20 ... +70 °C
LC 13/50-300/54 bDW NF SR PRE4	300 mA	10 V	41.7 V	12.5 W	15.3 W	70 mA	88 °C	-20 ... +70 °C

① Valid at 100 % dimming level.

② Depending on the selected output current.

③ Valid for immediate change of power supply type otherwise the starting time is valid.

④ Output current is mean value.

⑤ E.I.R.P.: Equivalent Isotropically Radiated Power.

⑥ The table only lists a number of possible operating points but does not cover each single point. The output current can be set within the total value range in 1-mA-steps.

1. Standards

EN 55015
 EN 61000-3-2
 EN 61000-3-3
 EN 61000-4-4
 EN 61000-4-5
 EN 61347-1
 EN 61347-2-13
 EN 62384
 EN 61547
 ETSI EN 300 330
 ETSI EN 301 489-1
 ETSI EN 300 328
 ETSI EN 301 489-17

According to EN 50172 for use in central battery systems

According to EN 60598-2-22 suitable for emergency lighting installations

1.1 Glow wire test

according to EN 61347-1 with increased temperature of 850 °C passed.

2. Thermal details and lifetime

2.1 Expected lifetime

Expected lifetime									
Type	Output current	ta	40 °C	45 °C	50 °C	55 °C	60 °C	65 °C	70 °C
	50 mA	tc	60 °C	65 °C	70 °C	75 °C	79 °C	84 °C	89 °C
		Lifetime	> 100,000 h	> 100,000 h	> 100,000 h	> 100,000 h	94,000 h	70,000 h	53,000 h
	> 500 – 110 mA	tc	60 °C	65 °C	70 °C	75 °C	80 °C	84 °C	–
		Lifetime	> 100,000 h	> 100,000 h	> 100,000 h	> 100,000 h	92,000 h	69,000 h	–
LC 13/50-300/54 bDW NF SR PRE4	> 110 – 170 mA	tc	60 °C	65 °C	70 °C	75 °C	80 °C	85 °C	–
		Lifetime	> 100,000 h	> 100,000 h	> 100,000 h	> 100,000 h	88,000 h	66,000 h	–
	> 170 – 231 mA	tc	61 °C	66 °C	71 °C	76 °C	80 °C	85 °C	–
		Lifetime	> 100,000 h	> 100,000 h	> 100,000 h	> 100,000 h	86,000 h	63,000 h	–
	> 231 – 300 mA	tc	60 °C	64 °C	69 °C	74 °C	79 °C	84 °C	88 °C
		Lifetime	> 100,000 h	> 100,000 h	> 100,000 h	> 100,000 h	97,000 h	72,000 h	53,000 h

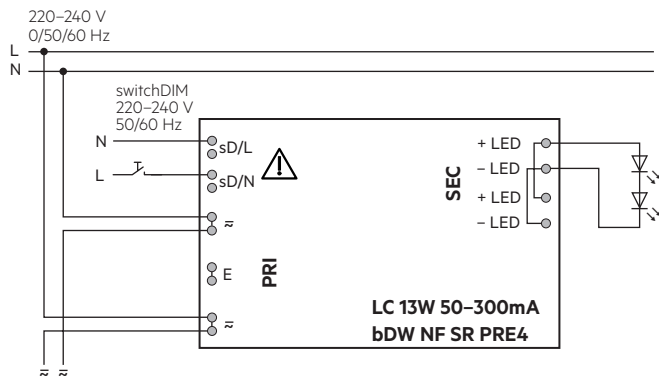
The LED driver is designed for a lifetime stated above under reference conditions and with a failure probability of less than 10 %.

The relation of tc to ta temperature depends also on the luminaire design.

If the measured tc temperature is approx. 5 K below tc max., ta temperature should be checked and eventually critical components (e.g. ELCAP) measured. Detailed information on request.

3. Installation / wiring

3.1 Circuit diagram



Device with loop through wiring function.

The earthing terminal of this device is not intended to protect against electric shock.

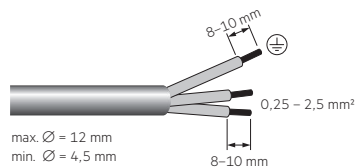
3.2 Wiring type and cross section

Mains supply wires

For wiring use stranded wire with ferrules or solid wire from 0.25–2.5 mm². Strip 8–10 mm of insulation from the cables to ensure perfect operation of the push terminals.

Use one wire for each terminal connector only.

Use each strain relief channel for one cable only.



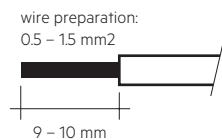
Interface wires:

For wiring use stranded wire with ferrules or solid wire from 0.5–1.5 mm².

Strip 9–10 mm of insulation from the cables to ensure perfect operation of the push terminals.

Use one wire for each terminal connector only.

Use each strain relief channel for one cable only.



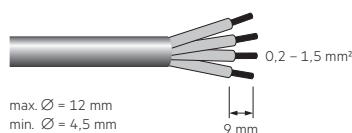
Secondary wires (LED module)

For wiring use stranded wire with ferrules or solid wire from 0.2–1.5 mm².

Strip 8.5–9.5 mm of insulation from the cables to ensure perfect operation of the push-wire terminals.

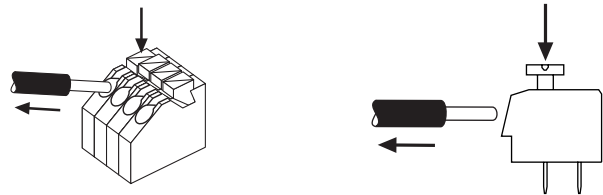
Use one wire for each terminal connector only.

Use each strain relief channel for one cable only.



3.3 Loose wiring

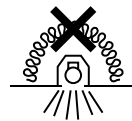
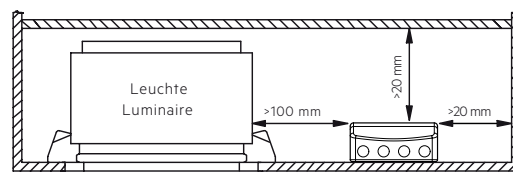
Press down the “push button” and remove the cable from front.



3.4 Fixing conditions

Dry, acidfree, oilfree, fatfree. It is not allowed to exceed the maximum ambient temperature (t_a) stated on the device. Minimum distances stated below are recommendations and depend on the actual luminaire.

Is not suitable for fixing in corner.



Device not suitable for covering with thermally insulating material

3.5 Wiring guidelines

- Run the secondary lines separately from the mains connections and lines to achieve good EMC performance.
- The max. secondary cable (LED module) length is 2 m (4 m circuit).
- For good EMC performance, keep the LED wiring as short as possible.
- To comply with the EMC regulations run the secondary wires (LED module) in parallel.
- Secondary switching is not permitted.
- The LED driver has no inverse-polarity protection on the secondary side. Wrong polarity can damage LED modules with no inverse-polarity protection.
- Wrong wiring of the LED driver can lead to malfunction or irreparable damage.
- Through wiring of mains is for connecting additional LED driver only. Max. permanent current of 16 A may not be exceeded.
- To avoid damage of the Driver, the wiring must be protected against short circuits to earth (sharp edged metal parts, metal cable clips, louver, etc.).
- Recommendation to check glowing in stand-by in combination with class I luminaires.
- The terminal (E) is not connected to the driver. Only for loop-through wiring of protective earth.

3.6 Hot plug-in

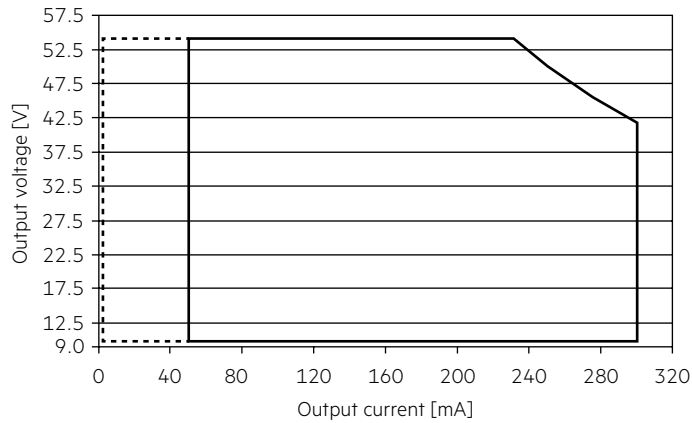


Hot plug-in is not supported due to residual output voltage of > 0 V up to mains voltage. Danger to life.

When connecting an LED load, restart the device to activate the LED output. This can be done via mains reset or via interface (switchDIM).

4. Electrical values

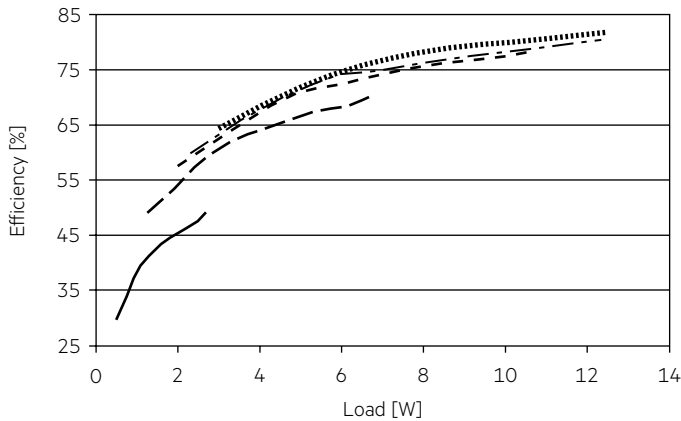
4.1 Operating window



- Operating window 100 %
- - - - - Operating window dimmed

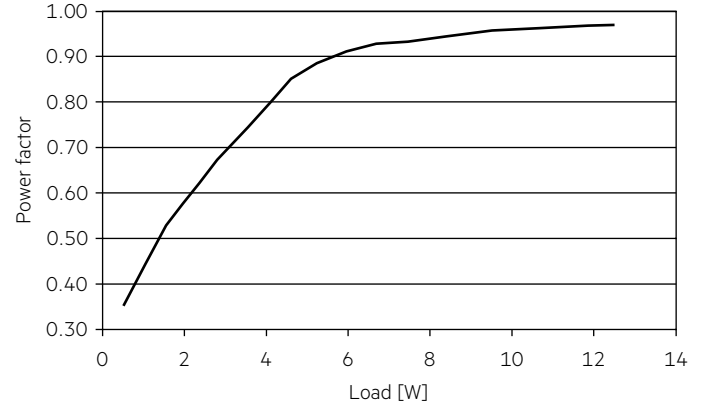
Make sure that the LED driver is operated within the given window under all operating conditions. Special attention needs to be paid at dimming and DC emergency operation as the forward voltage of the connected LED modules varies with the dimming level, due to the implemented amplitude dimming technology. Coming below the specified minimum output voltage of the LED driver may cause the device to shut-down. See chapter "6.9 DC operation" for more information.

4.2 Efficiency vs load

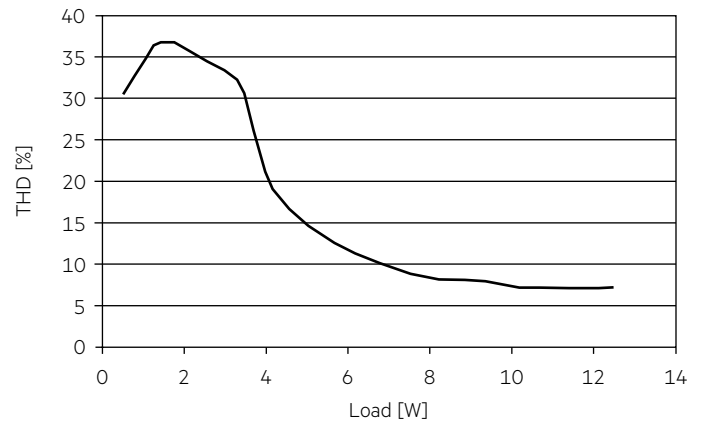


- 50 mA
- - - 125 mA
- . - . 200 mA
- · · 231 mA
- · · · · 300 mA

4.3 Power factor vs load



4.4 THD vs load



100 % load corresponds to the max. output power (full load) according to the table on page 2.

4.5 Maximum loading of automatic circuit breakers in relation to inrush current

Automatic circuit breaker type	C10	C13	C16	C20	B10	B13	B16	B20	Inrush current	
									I_{max}	time
Installation Ø	1.5 mm ²	1.5 mm ²	2.5 mm ²	2.5 mm ²	1.5 mm ²	1.5 mm ²	2.5 mm ²	2.5 mm ²		
LC 13/50-300/54 bDW NF SR PRE4	30	40	50	63	18	24	30	38	36.4 A	128 µs

These are max. values calculated out of inrush current! Please consider not to exceed the maximum rated continuous current of the circuit breaker.

Calculation uses typical values from ABB series S200 as a reference.

Actual values may differ due to used circuit breaker types and installation environment.

4.6 Harmonic distortion in the mains supply (at 230 V / 50 Hz and full load) in %

	THD	3.	5.	7.	9.	11.
		LC 13/50-300/54 bDW NF SR PRE4	< 7	< 2	< 2	< 3

4.7 Dimming

Dimming range 1% to 100% (of max. current)

Dimming curve is adapted to the eye sensitiveness.

Dimming is realized by amplitude dimming.

Physical minimal current is 1% of max. current of the driver.

5. Software / Programming / Interfaces

5.1 Software / programming

With appropriate software and interface different functions can be activated and various parameters can be configured in the LED driver. The Driver supports the following software and interfaces:

Software / hardware for configuration:

- companionSUITE (deviceGENERATOR, deviceCONFIGURATOR, deviceANALYSER)

Interfaces for data transfer:

- NFC

5.2 Nearfield communication (NFC)

The NFC Interface allows wireless communication with the LED driver. This interface offers the option to write configuration and to read configuration, errors and events with the companionSUITE. A correct communication between the LED driver and the NFC antenna can only be guaranteed if the antenna is placed directly on the Driver. Any material placed between the LED driver and the NFC antenna can cause a deterioration of the communication quality. After programming the device via NFC power up the device one time for one second till the deviceANALYSER can read out the parameters. With a strong NFC antenna, several products can be programmed simultaneously ("multi device programming"). We recommend the use of following NFC antenna: www.tridonic.com/nfc-readers

NFC is complied with ISO/IEC 15963 standard.

Changing parameters via NFC shall be done by qualified engineers only.

5.3 Control input switchDIM

A standard push button can be connected on the input terminals. This function have to be activated before using.














The control signal uses the usual mains voltage. It is essential to observe the specifications of the terminals (sD/L or sD/N) for connecting the switched phase of the pushbutton and the neutral wire. Profile change see handbook https://www.tridonic.com/com/en/download/technical/Documentation_Tridonic_4remote_BT_EN.pdf

6. Functions

☉ companionSUITE:

NFC

The companionSUITE with deviceGENERATOR, deviceCONFIGURATOR and deviceANALYSER is available via our WEB page:
<https://www.tridonic.com/com/en/products/companionsuite.asp>

Icon	Function	NFC
	OEM Identification	☉
	OEM GTIN	☉
	Luminaire data	☉
	Label information	☉
	LED current	☉
	Factory reset	☉
	Constant light output (CLO)	☉
	DC level	☉
	Enhanced power on level (ePOL)	☉
	deviceKEY	☉
	Energy reports	☉
	Lifetime indicator	☉
	switchDIM	☉

6.1 OEM Identification



The OEM (Original Equipment Manufacturer) can set his own identification number.

DALI Part 251: Memory bank 1 extension.
Store via NFC, read via bDW.

6.2 OEM GTIN



The Original Equipment Manufacturer (OEM) can set his own Global Trade Item Number (GTIN).

DALI Part 251: Memory bank 1 extension.
Store via NFC, read via bDW.

6.3 Luminaire data



This function provides the asset management with accurate data about the luminaire.

DALI Part 251: Memory bank 1 extension.
Store via NFC, read via bDW.

6.4 Label information



In production, an individual label can be printed out for each device. For this there are different default values (Batch No., Production Date, ...) available. In addition, you can use these two text input fields to insert your own luminaire information and print it out.

6.5 LED current



The LED output current must be adapted to the connected LED module. The value is limited by the current range of the respective device.

6.6 Factory reset



This device supports the function to reset all parameters back to factory defaults.

6.7 Enhanced Constant Light Output (eCLO)



With this function the light output of the LED module can be kept equal over the lifetime.

The light output of an LED module reduces over the course of its lifetime. The Constant Light Output (eCLO) function compensates for this natural decline by constantly increasing the output current of the LED driver throughout its lifetime.

Enhanced eCLO shall be achieved by limitation of the LED current at the commissioning of the LED driver and providing a linear interpolation of the current over the time, depending on the data points given by the user.

The user has to insert up to eight pairs of data (time, level).

The output curve is the result of connecting the user data points linear.

Detailed description for eCLO see product manual.

The minimal CLO starting point is limited by the smallest output current of the LED driver.

6.8 Light level in DC operation



In emergency light systems with a central battery supply the DC recognition function uses the input voltage to detect if emergency mode is present.

The LED driver then automatically switches to DC mode and dims the light to the defined DC level.

Without DC recognition different and more complex solutions would have to be applied in order to detect emergency mode.

DC recognition is integrated in the device as standard.

No additional commissioning is necessary for activation.



This is a safety-relevant parameter.

The setting is relevant for the dimensioning of the central battery system.

The LED driver is designed to operate on DC voltage and pulsed DC voltage. For a reliable operation, make sure that also in DC emergency operation the LED driver is run within the specified conditions as stated in chapter "4.1 operating window".

Light output level in DC operation: programmable 1 – 100 %
(factory default = 15 %, EOF_i = 0.13).

The voltage-dependent input current of Driver incl. LED module is depending on the used load.

The voltage-dependent no-load current of Driver (without or defect LED module) is for:

AC: < 19.1 mA

DC: < 1.94 mA

6.9 deviceKEY



With this function, individual device functions can be protected from unauthorized changes by a password.

6.10 Energy reporting



This function provides the information related to energy reporting accessible through memory banks in this driver.

Several functions and values could be read out to gain access in Content management systems.

Report and values for Active power, Active Energy and many more can be read out.

6.11 Diagnostics and maintenance



This function complies to DiiA specification DALI Part 253 - Diagnostics and maintenance. It provides the information related to diagnostics and maintenance information accessible through memory banks. Several functions and values could be read out to gain access in Content management systems. Report and values for failure behaviour, driver conditions and malfunctions trigger points can be read out.

6.12 Lifetime indicator

This function provides the information related to driver health and aging rates. Constant monitoring allows us to make an estimation of the health status of the device. This is an indication of the condition of the driver and a guide as to when a driver should be replaced.

LED driver health:



Indicates the remaining lifetime of the driver.

100 % is a new device, 0 % should be urgently replaced.

Helps the advanced user to understand what is the health status of the driver.

Aging rate:



Indicates the degree of aging based on current conditions.

0 % no aging, > 20 % driver may not survive warranty.

Please check the LED driver condition.



These parameters are only used to estimate the condition of the device.

Warranty conditions are not affected by this.

7. Protective features

7.1 Intelligent temperature guard (ITG)



The Intelligent temperature guard (ITG) function provides effective protection against thermal overloads by slowly reducing the output if a defined internal temperature is exceeded.

The reduction of overtemperatures takes place in small steps every two minutes. As soon as the temperature drops again, the output power is gradually increased every 10 minutes.

On DC operation this function is deactivated to fulfill emergency requirements.

7.2 Intelligent Voltage Guard (IVG)



Intelligent Voltage Guard is the name of the electronic monitoring of the mains voltage. It immediately shows if the mains voltage rises above certain thresholds. Measures can then be taken quickly to prevent damage to the LED driver.

- If the mains voltage rises above approx. 280 Vrms (voltage depends on the LED driver type), the LED light starts flashing on and off.
- To avoid a damage of the LED driver the mains supply has to be switched off at this signal.

7.3 Short-circuit behaviour

In case of a short-circuit at the LED output the LED output is switched off. After restart of the LED driver the output will be activated again. The restart can either be done via mains reset or via interface.

7.4 No-load operation

The LED driver will not be damaged in no-load operation. The output will be deactivated and is therefore free of voltage. If a LED load is connected the device has to be restarted before the output will be activated again. The restart can either be done via mains reset or via interface.

7.5 Overload protection

If the maximum load is exceeded by a defined internal limit, the LED driver turns off the LED output. After restart of the LED driver the output will be activated again.

The restart can either be done via mains reset or via interface.

7.6 Insulation between terminals

Insulation	Mains	LED	sD	E
Mains	–	double	basic	basic
LED	double	–	double	double
sD	basic	double	–	basic
E	basic	double	basic	–

basic ... represents basic insulation.

double ... represents double or reinforced insulation.

8. Miscellaneous

8.1 Insulation and electric strength testing of luminaires

Electronic devices can be damaged by high voltage. This has to be considered during the routine testing of the luminaires in production.

According to EN 60598-1 Annex Q (informative only!) or ENEC 303-Annex A, each luminaire should be submitted to an insulation test with 500 V_{DC} for 1 second. This test voltage should be connected between the interconnected phase and neutral terminals and the earth terminal. The insulation resistance must be at least 2 MΩ.

As an alternative, EN 60598-1 Annex Q describes a test of the electrical strength with 1500 V_{AC} (or 1.414 x 1500 V_{DC}). To avoid damage to the electronic devices this test must not be conducted.

8.2 Conditions of use and storage

Humidity: 5% up to max. 85%,
not condensed
(max. 56 days/year at 85%)

Storage temperature: -40 °C up to max. +85 °C

The devices have to be acclimatised to the specified temperature range (ta) before they can be operated.

The LED driver is declared as inbuilt LED controlgear, meaning it is intended to be used within a luminaire enclosure.

If the product is used outside a luminaire, the installation must provide suitable protection for people and environment (e.g. in illuminated ceilings).

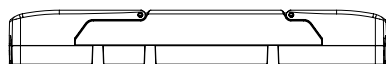
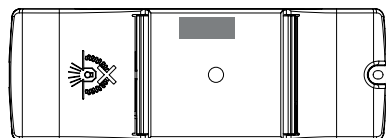
8.3 Placement

basicDIM Wireless has an integrated antenna for easy integration. In order to maximize the range in every direction some design guidelines should be taken into consideration when mounting the device.

The antenna is located on the corner of the enclosure. It is on the top side of the internal PCB (Printed Circuit Board).

When the device is mounted on a metal plate (e.g. frame of a luminaire), it may efficiently block the radio frequency signal. In this case, a cut-out underneath the antenna may be needed for the RF signal to exit the structure. The cut-out area should be as large as possible. Also the device should be placed as far away from any vertical metal structures as possible.

■ Antenna location



The range of the communication signal is depending on the environment e.g. luminaire, construction of the building, furnitures or humans and needs to be tested and approved in the installation.

8.4 Control terminals

In some countries, basic insulated control terminals are to be marked with this symbol.



Control terminals marked "Caution" can become live in the event of a fault and are therefore not safe to touch. Circuits connected to control terminals marked in this way must be insulated according to the supply voltage of the controlgear and all terminals connected to such circuits must be protected against accidental contact.

8.5 Disposal



According to the WEEE directive return old equipment at appropriate collection facilities.