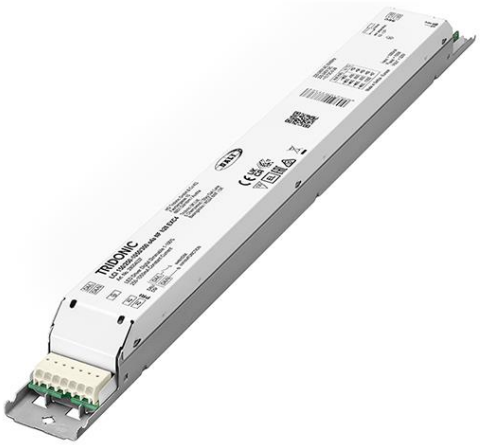
## Driver LCI 150W 250-1050mA o4a NF h28 EXC4 (INDUSTRY)

premium series non-SELV



### Product description

_ Constant current built-in Driver for LED, particularly suitable for industrial applications in tough environments with elevated ambient temperatures such as warehouses or factories
_ Dimming range 1 to 100 % (min. 10.5 mA)
_ For luminaires of protection class I and protection class II
_ Output current adjustable between 250 – 1,050 mA
_ Max. output power 150 W
_ Suitable for mains voltage peaks (burst/surge) up to 4 kV
_ Expanded temperature range of -40 … +80 °C
_ Nominal lifetime up to 100,000 h
_ 8 years guarantee (conditions at https://www.tridonic.com/en/int/services/manufacturer-guarantee-conditions)

### Housing properties

_ White slim metal casing
_ Type of protection IP20

### Interfaces

_ Near field communication (NFC)
_ one4all (DALI-2 DT 6, DSI, switchDIM, corridorFUNCTION)
_ Terminal blocks: 0° push terminals

### Functions

_ Constant light output function (CLO)
_ Intelligent Temperature Guard (overtemperature protection)
_ Intelligent Voltage Guard (overvoltage and undervoltage monitoring)
_ Protective features (overtemperature, short-circuit, overload, no-load, input voltage range)
_ Suitable for emergency escape lighting systems acc. to EN 50172
_ LTI (Lifetime Indicator)

### Benefits

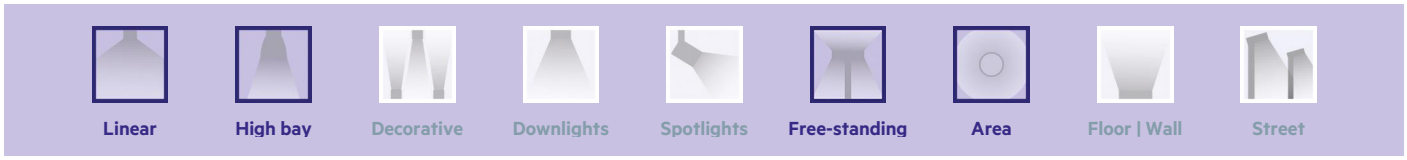
_ Flexible configuration via companionSUITE (NFC, DALI)
_ Application-oriented operating window for maximum compatibility
_ Extended vibration damping
_ Increased safety through robust design and advanced testing under extreme test conditions
_ High reliability through the selection of exclusive components

### Typical applications

_ For linear/area lighting in industry applications

### Website

http://www.tridonic.com/28004037



TRIDONIC

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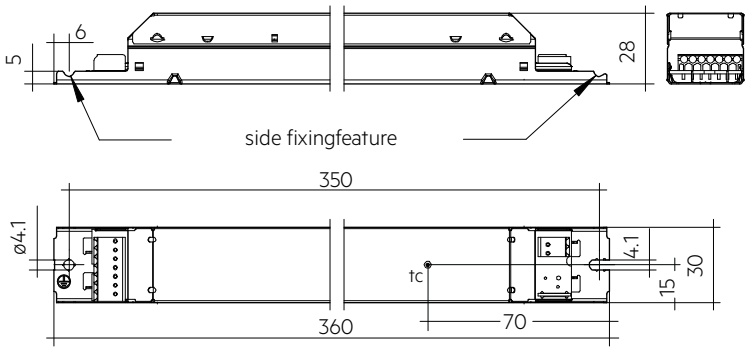
premium series non-SELV




### Ordering data

| Type | Article number | Packaging, carton | Packaging, pallet | Weight per pc. |
|---|---|---|---|---|
| **LCI 150/250-1050/300 o4a NF h28 EXC4** | **28004037** | 10 pc(s). | 600 pc(s). | 0.326 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 | 686 mA |
| Typ. current (220 V, 0 Hz, full load, EOFx dimlevel) ①② | 117 mA |
| Leakage current (at 230 V, 50 Hz, full load) ①② | < 300 µA |
| Max. input power | 155.7 W |
| Output power range (P_rated) | 20 – 150 W |
| Typ. efficiency (at 230 V, 50 Hz, full load) ②③ | 96 % |
| λ (at 230 V, 50 Hz, full load) ① | 0.99 |
| λ over full operating range (max.) | 0.99 |
| λ over full operating range (min.) | 0.73C |
| Typ. power consumption on stand-by ③ | < 0.29 W |
| Typ. input current in no-load operation ③ | < 67 mA |
| Typ. input power in no-load operation ③ | < 0.3 W |
| In-rush current (peak / duration) | 18.9 A / 30 µs |
| THD (at 230 V, 50 Hz, full load) ① | < 7 % |
| Starting time (at 230 V, 50 Hz, full load) ① | < 0.7 s |
| Starting time (DC mode) | < 0.3 s |
| Switchover time (AC/DC) ④ | < 0.1 s |
| Turn off time (at 230 V, 50 Hz, full load) | < 0.01 s |
| Output current tolerance ①⑤ | ± 3 % |
| Max. output current peak (non-repetitive) | 1,470 mA |
| Output LF current ripple (< 120 Hz) ① | ± 1.5 % |
| Output P_ST_LM (at full load) | ≤ 1 |
| Output SVM (at full load) | ≤ 0.4 |
| Max. output voltage (U-OUT) | 320 V |
| Dimming range | 1 – 100 % (min. 10.5 mA) |
| Mains surge capability (between L - N) | 4 kV |
| Mains surge capability (between L/N - PE) | 4 kV |
| Surge voltage at output side (against PE) | 4 kV |
| Type of protection | IP20 |
| Lifetime | up to 100,000 h |
| Guarantee (conditions at www.tridonic.com) | 8 Year(s) |
| Dimensions L x W x H | 360 x 30 x 28 mm |

## Approval marks

lumDATA NFC DALI 2 IP20 130 EL RoHS

## Standards

EN 55015, EN 60068-2-27, EN 60068-2-64, EN 61000-3-2, EN 61000-3-3, EN 61347-1, EN 61347-2-13, EN 62384, EN 61547, EN 62386-101, EN 62386-102, EN 62386-207 (DALI-2), EN 50172, EN 60598-2-22

## Specific technical data

| Type | Output current⑤⑥ | Min. output voltage | Max. output voltage | Max. output power | Typ. power consumption (at 230 V, 50 Hz, full load) | Typ. current consumption (at 230 V, 50 Hz, full load) | tc point max. | Ambient temperature ta |
|---|---|---|---|---|---|---|---|---|
| **LCI 150/250-1050/300 o4a NF h28 EXC4** | 250 mA | 80 V | 300.0 V | 75 W | 78.4 W | 356 mA | 82 °C | -40 … +80 °C |
| **LCI 150/250-1050/300 o4a NF h28 EXC4** | 350 mA | 80 V | 300.0 V | 105 W | 108.9 W | 485 mA | 84 °C | -40 … +80 °C |
| **LCI 150/250-1050/300 o4a NF h28 EXC4** | 450 mA | 80 V | 300.0 V | 135 W | 139.8 W | 618 mA | 89 °C | -40 … +80 °C |
| **LCI 150/250-1050/300 o4a NF h28 EXC4** | 500 mA | 80 V | 300.0 V | 150 W | 155.1 W | 684 mA | 89 °C | -40 … +80 °C |
| **LCI 150/250-1050/300 o4a NF h28 EXC4** | 550 mA | 80 V | 272.7 V | 150 W | 155.2 W | 684 mA | 89 °C | -40 … +80 °C |
| **LCI 150/250-1050/300 o4a NF h28 EXC4** | 650 mA | 80 V | 230.8 V | 150 W | 155.3 W | 685 mA | 89 °C | -40 … +75 °C |
| **LCI 150/250-1050/300 o4a NF h28 EXC4** | 750 mA | 80 V | 200.0 V | 150 W | 155.4 W | 685 mA | 89 °C | -40 … +75 °C |
| **LCI 150/250-1050/300 o4a NF h28 EXC4** | 850 mA | 80 V | 176.5 V | 150 W | 155.5 W | 686 mA | 87 °C | -40 … +65 °C |
| **LCI 150/250-1050/300 o4a NF h28 EXC4** | 950 mA | 80 V | 157.9 V | 150 W | 155.6 W | 686 mA | 87 °C | -40 … +65 °C |
| **LCI 150/250-1050/300 o4a NF h28 EXC4** | 1,050 mA | 80 V | 142.9 V | 150 W | 155.7 W | 686 mA | 87 °C | -40 … +65 °C |

① Valid at 100 % dimming level.
② Depending on the selected output current.
③ Depending on the DALI traffic at the interface. DALI bus power supply deactivated.
④ Valid for immediate change of power supply type otherwise the starting time is valid.
⑤ Output current is mean value.
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 60068-2-27 (shock – test case: 1,000 shocks in 6 directions with 30 g / 18 ms)
EN 60068-2-64 (vibration – test case: acc. to table A.1 transport / category 2)
EN 61000-3-2
EN 61000-3-3
EN 61347-1
EN 61347-2-13
EN 62384
EN 61547
EN 62386-101 (DALI-2)
EN 62386-102 (DALI-2)
EN 62386-207 (DALI-2, including part 251, 252, 253)
According to EN 50172 for use in central battery systems
According to EN 60598-2-22 suitable for emergency lighting installations

## 2. Thermal details and lifetime

### 2.1 Expected lifetime

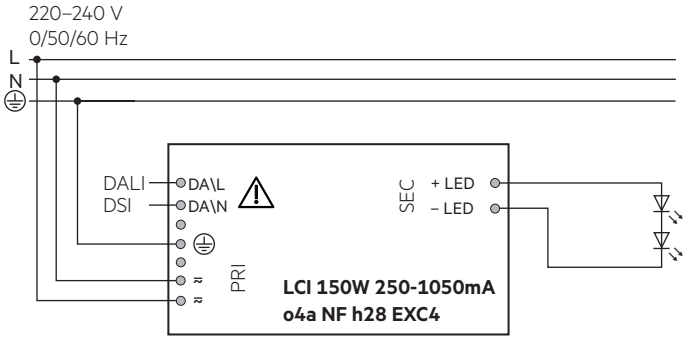
| Type | Output current | ta | 50 °C | 55 °C | 60 °C | 65 °C | 70 °C | 75 °C | 80 °C |
|---|---|---|---|---|---|---|---|---|---|
| **LCI 150/250-1050/300 o4a NF h28 EXC4** | 10.5 – 250 mA | tc | 56 °C | 61 °C | 65 °C | 69 °C | 74 °C | 78 °C | 82 °C |
| | | Lifetime | > 100,000 h | > 100,000 h | > 100,000 h | > 100,000 h | > 100,000 h | > 100,000 h | > 100,000 h |
| | > 250 – 400 mA | tc | 59 °C | 63 °C | 67 °C | 71 °C | 76 °C | 80 °C | 84 °C |
| | | Lifetime | > 100,000 h | > 100,000 h | > 100,000 h | > 100,000 h | > 100,000 h | > 100,000 h | 79,000 h |
| | > 400 – 600 mA | tc | 64 °C | 68 °C | 72 °C | 76 °C | 80 °C | 84 °C | 89 °C |
| | | Lifetime | > 100,000 h | > 100,000 h | > 100,000 h | > 100,000 h | > 100,000 h | 84,000 h | 61,000 h |
| | > 600 – 800 mA | tc | 68 °C | 72 °C | 77 °C | 81 °C | 85 °C | 89 °C | – |
| | | Lifetime | > 100,000 h | > 100,000 h | > 100,000 h | > 100,000 h | 98,000 h | 73,000 h | – |
| | > 800 – 1,050 mA | tc | 75 °C | 79 °C | 82 °C | 87 °C | – | – | – |
| | | Lifetime | > 100,000 h | > 100,000 h | > 100,000 h | 92,000 h | – | – | – |

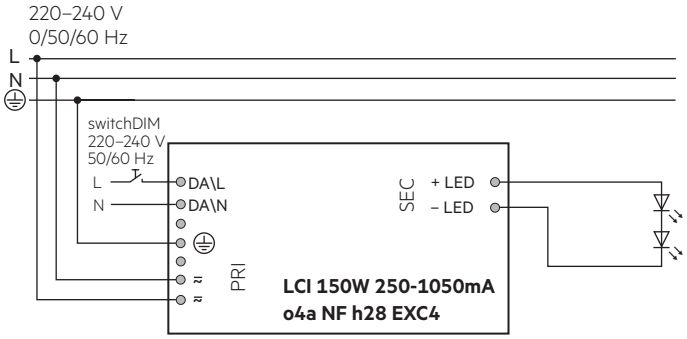
The LED driver is designed for a lifetime stated above under reference conditions and with a failure probability of less than 10 %.

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

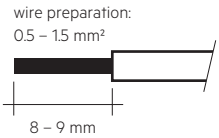


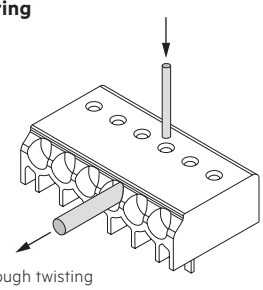

### 3.2 Wiring type and cross section

For wiring use solid wire from 0.5 – 1.5 mm².
Strip 8 – 9 mm of insulation from the cables to ensure perfect operation of terminals.

LED module/LED driver/supply




### 3.3 Loose wiring



Loosen wire through twisting and pulling or using a Ø 1 mm release tool

### 3.4 Device assembly

For mounting the device washer with outer diameter of 10 mm should be used. The tightening force of the M4 screw should be 3.5 Nm.

### 3.5 Wiring guidelines

- The cables should be run separately from the mains connections and mains cables to ensure good EMC conditions.
- The LED wiring should be kept as short as possible to ensure good EMC. The max. secondary cable length is 2 m (4 m circuit).
- 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.
- With mains transients of 4 kV can voltage peaks up to 4 kV occur against PE at the output of the LED driver. This has to be considered concerning the dielectric strength of the LED module (insulation against PE).
- 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.).

### 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 (DALI, DSI, switchDIM).

### 3.7 Earth connection

The earth connection is conducted as protection earth (PE). The LED driver can be earthed via earth terminal or metal housing. If the LED driver will be earthed, protection earth (PE) has to be used. There is no earth connection required for the functionality of the LED driver. Earth connection is recommended to improve following behaviour:
- Electromagnetic interferences (EMI)
- Transmission of mains transients to the LED output

In general it is recommended to earth the LED driver if the LED module is mounted on earthed luminaire parts respectively heat sinks and thereby representing a high capacity against earth.

### 3.8 Replace LED module

1. Mains off
2. Remove LED module
3. Wait for 30 seconds
4. Connect LED module again

Hot plug-in or secondary switching of LEDs is not permitted and may cause a very high current to the LEDs.

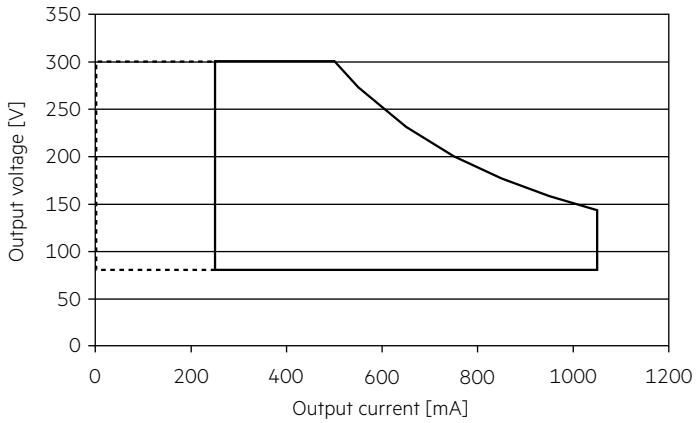
### 3.9 Industry application

This driver is designed for industry applications.
Due to the high performance of the driver, there may be a slightly increased noise level.
The starting sound, when switching on the driver, can possibly be heard more.

The nominal lifetime of 100,000 hours and its temperatures are designed for standard applications.
However, the driver can also withstand higher temperatures, which are shown in Table 2.1.
At high temperatures, the lifetime is reduced accordingly.

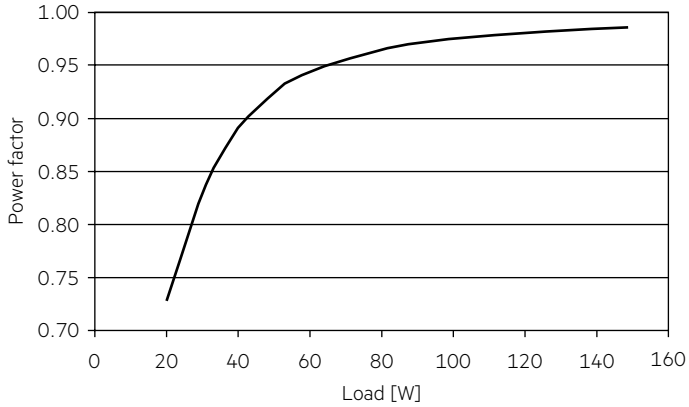
## 4. Electrical values

### 4.1 Operating window

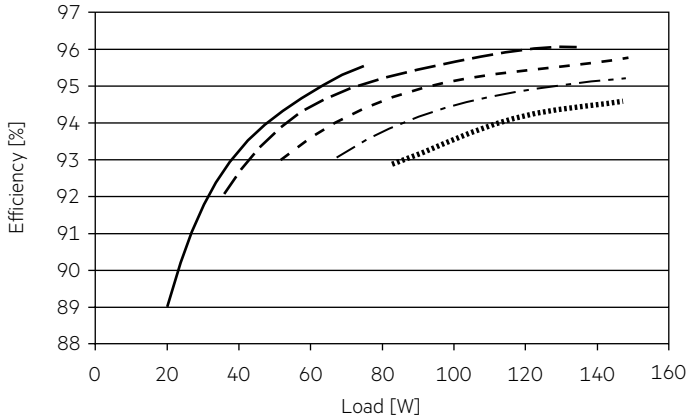



Make sure that the LED driver is operated within the given window under all operating conditions.

### 4.3 Power factor vs load



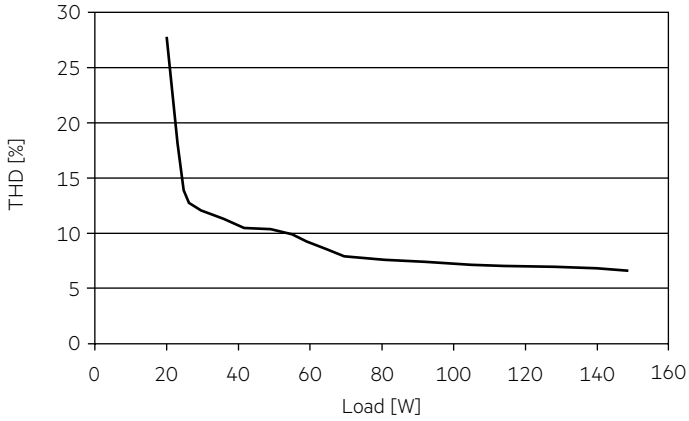

### 4.2 Efficiency vs load




DALI bus power supply deactivated.

250 mA
450 mA
650 mA
850 mA
1050 mA

### 4.4 THD vs load (without harmonic < 5 mA or 0.6 % of the input current)




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

| Automatic circuit breaker type | C10 | C13 | C16 | C20 | B10 | B13 | B16 | B20 | Inrush current | |
|---|---|---|---|---|---|---|---|---|---|---|
| Installation Ø | 1.5 mm² | 1.5 mm² | 2.5 mm² | 4 mm² | 1.5 mm² | 1.5 mm² | 2.5 mm² | 4 mm² | $I_{max}$ | time |
| **LCI 150/250-1050/300 o4a NF h28 EXC4** | 28 | 31 | 33 | 36 | 17 | 19 | 20 | 22 | 18.9 A | 30 µs |

These are max. values! Please consider not to exceed the maximum 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. |
|---|---|---|---|---|---|---|
| **LCI 150/250-1050/300 o4a NF h28 EXC4** | < 7 | < 5 | < 3 | < 3 | < 2 | < 1 |

Acc. to 61000-3-2. Harmonics < 5 mA or < 0.6 % (whatever is greater) of the input current are not considered for calculation of THD.

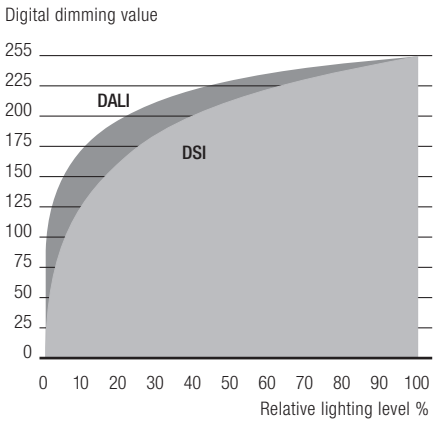
### 4.7 Dimming

Dimming range 1 % to 100 %
Digital control with:
- DSI signal: 8 bit Manchester Code
  Speed 1 % to 100 % in 1.4 s
- DALI signal: 16 bit Manchester Code
  Speed 1 % to 100 % in 0.2 s
  Programmable parameter:
  Minimum dimming level
  Maximum dimming level
  Default minimum = 1 %
  Programmable range 1 % ≤ MIN ≤ 100 %
  Default maximum = 100 %
  Programmable range 100 % ≥ MAX ≥ 1 %

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.

### 4.8 Dimming characteristics




Dimming characteristics as seen by the human eye

## 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)
- masterCONFIGURATOR

Interfaces for data transfer:
- NFC
- Control input DALI

### 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.
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 DALI

The control input is non-polar for digital control signals (DALI).
The control signal is not SELV. The control cable has to be installed in accordance to the requirements of low voltage installations.

Digital control with:
- DALI signal: 16 bit
- DSI signal: 8 bit

### 5.4 switchDIM

Integrated switchDIM function allows a direct connection of a pushbutton for dimming and switching.
Brief push (< 0.6 s) switches LED driver ON and OFF. The dimm level is saved at power-down and restored at power-up.
When the pushbutton is held, LED modules are dimmed. After repush the LED modules are dimmed in the opposite direction.
In installations with LED drivers with different dimming levels or opposite dimming directions (e.g. after a system extension), all LED drivers can be synchronized to 50 % dimming level by a 10 s push.
Use of pushbutton with indicator lamp is not permitted.

## 6. Functions

⊙ companionSUITE:
DALI-USB, NFC
The companionSUITE with deviceGENERATOR, deviceCONFIGURATOR and deviceANALYSER is available via our WEB page:
https://www.tridonic.com/com/en/products/companionsuite.asp

◈ masterCONFIGURATOR:
DALI-USB
The masterCONFIGURATOR is available via our WEB page:
https://www.tridonic.com/com/en/software-masterconfigurator.asp

| Icon | Function | NFC | DALI-2 | |
|---|---|---|---|---|
| | OEM Identification | ⊙ | ⊙ | – |
| | OEM GTIN | ⊙ | ⊙ | – |
| | Luminaire data | ⊙ | ⊙ | – |
| | LED current | ⊙ | ⊙ | ◈ |
| | Lifetime indicator | ⊙ | ⊙ | – |
| | Device operating mode | ⊙ | ⊙ | ◈ |
| | switchDIM | ⊙ | ⊙ | ◈ |
| | corridorFUNCTION | ⊙ | ⊙ | ◈ |
| | Constant light output (eCLO) | ⊙ | ⊙ | ◈ |
| | DC level | ⊙ | ⊙ | ◈ |
| | Enhanced power on level (ePOL) | ⊙ | ⊙ | ◈ |
| | DALI default parameters | ⊙ | ⊙ | ◈ |
| | Scenes and groups | ⊙ | ⊙ | ◈ |
| | fade2zero | ⊙ | ⊙ | ◈ |
| | Power-up fading | ⊙ | ⊙ | ◈ |
| | deviceKEY | ⊙ | ⊙ | – |
| | Intelligent voltage guard (IVG) | ⊙ | ⊙ | ◈ |
| | Dimming curve | ⊙ | ⊙ | ◈ |
| | Factory reset | ⊙ | ⊙ | – |

### 6.1 OEM Identification

The OEM (Original Equipment Manufacturer) can set his own identification number.
DALI Part 251: Memory bank 1 extension.

### 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.

### 6.3 Luminaire data

This function provides the asset management with accurate data about the luminaire.
DALI Part 251: Memory bank 1 extension.
DALI Part 253: Luminaire maintenance data.

### 6.4 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.

The output current of the LED driver can be adjusted in a certain range.
For adjustment there are 2 options available.

Option 1: DALI
Adjustment is done by companionSUITE or by masterCONFIGURATOR.

Option 2: NFC
Adjustment is done by companionSUITE via NFC.

### 6.5 Device operating mode

A Tridonic Driver supports several control signals.
These control signals are automatically detected and the mode is adapted.
If only one special device mode is required, this mode can be selected.
“Automatic detection” is the default setting.

### 6.6 switchDIM

Integrated switchDIM function allows a direct connection of a pushbutton for dimming and switching.
Brief push (< 0.6 s) switches LED driver ON and OFF. The dimm level is saved at power-down and restored at power-up. When the pushbutton is held, LED modules are dimmed. After repush the LED modules are dimmed in the opposite direction.
In installations with LED drivers with different dimming levels or opposite dimming directions (e.g. after a system extension), all LED drivers can be synchronized to 50 % dimming level by a 10 s push.
Use of pushbutton with indicator lamp is not permitted.

### 6.7 corridorFUNCTION

With the corridorFUNCTION and a commercially available motion detector, it is easy to adapt the lighting in one area to its use.
That is, when the area is entered by a person, the lighting dims instantly to the desired brightness and is available in full strength.
After the area is left by the person, the brightness dims slowly to a smaller value or switches off completely.
The individual parameters of the desired profile, such as brightness values or delay times, can be adjusted flexibly and individually.

### 6.8 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.

### 6.9 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 and DALI bus power supply deactivated) is for:
AC: < 77 mA
DC: < 1.35 mA

In DC operation dimming mode can be activated.
If Dimming on DC is activated the requirements of the DC recognition function are ignored.
Even if DC is detected, the LED driver continues to behave as in AC mode

- The present dimming level is retained
- An emergency light level defined for the DC recognition function (DC level) is ignored
- Control signals via DALI continue to be executed

If Dimming on DC is activated then emergency mode is not recognised.
The device no longer automatically switches to the emergency light level.

### 6.10 Enhanced power on level (ePOL)

The Enhanced Power On Level parameter defines the power level that is set automatically when power is restored after a power failure.
The Enhanced Power On Level can be set to a fixed value (0 – 100 %) or can recall the memory value.
The memory value is the last value the LED driver was set to before the power failure.
This value applies not only in DALI device operating mode, but also in the device operating mode switchDIM.

### 6.11 Energy reporting

This function complies to DiiA specification DALI Part 252 - Energy reporting. It 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.

### 6.12 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.

### 6.13 DALI default parameters

In order for all luminaires to react the same for each operation (switching, dimming, scene recall ...), these values must be set the same.
These DALI standard parameters are supported by every DALI-2 device.

### 6.14 Scenes and groups

Each device can be a member of up to 16 groups.
Also, 16 different scene values can be stored in each device.

### 6.15 fade2zero

When the Driver is switched off, fade2zero allows a smooth dimming down to almost zero.
Activate the fade2zero function when programming with companionSUITE and set a DALI fade time. fade2zero only works if the minimum dimming level of the Driver is the default value.
The device then dims to far below the limit of its working window (dimming range).
This function is deactivated by default.

### 6.16 Power-up fading

The power-up function offers the opportunity to modify the on behavior. The time for fading on can be adjusted in a range of 0.2 to 16 seconds. According to this value, the device dims from 0 % up to the power-on level. By factory default no fading time is set (= 0 seconds).

### 6.17 Dimming curve

DALI:
The desired dimming behaviour is selected via two different dimming curves (logarithmic or linear).
The default setting of the dimming behaviour is logarithmic.

### 6.18 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 (DALI, DSI, switchDIM)

### 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.

### 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 (DALI, DSI, switchDIM).

### 7.6 Insulation between terminals

| **Insulation** | Mains | PE | LED | DALI |
|---|---|---|---|---|
| Mains | – | basic | – | basic |
| PE | basic | – | basic | basic |
| LED | – | basic | – | basic |
| DALI | basic | basic | basic | – |

basic ... represents basic insulation.

## 8. Extended industry standard

The devices of the industrial series are tested with various tests.
For the special industrial sector additional extended tests are carried out.
A special test method (see EN 60068-2-27 (shock – test case: 1,000 shocks in 6 directions with 30 g / 18 ms) and EN 60068-2-64 (vibration – test case: acc. to table A.1 transport / category 2)) ensures operation in extreme environmental conditions.
This robustness is also achieved by the selection of special exclusive components.

## 9. Miscellaneous

### 9.1 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 IEC 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, IEC 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.

### 9.2 Control terminals

⚠ There is a risk of electric shock when touching these terminals in case of failure.

### 9.3 Conditions of use and storage

| | |
|---|---|
| Humidity: | 5 % up to max. 85 %,<br>not condensed<br>(max. 56 days/year at 85 %) |
| Storage temperature: | -40 °C up to max. +80 °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).

### 9.4 Maximum number of switching cycles

All LED driver are tested with 50,000 switching cycles.
The actually achieved number of switching cycles is significantly higher.

### 9.5 Additional information

Additional technical information at www.tridonic.com → Technical Data

Lifetime declarations are informative and represent no warranty claim.
No warranty if device was opened.