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# Technical application guide

## Outdoor LED drivers for Emergency Lighting operation


05/2025

## Emergency Lighting (EL) and EL mark

Emergency Lighting (EL) refers to lighting systems that are designed to provide illumination in the event of a power outage or an emergency situation where the main power supply is disrupted. The primary purpose of Emergency Lighting is to ensure the safety of people by providing enough light to evacuate a building or navigate through a space during an emergency.

Emergency Lighting is a critical part of building safety. Regular testing, maintenance, and compliance with standards are essential to ensure the effectiveness of EL systems when needed the most.

To meet these safety and performance standards, lighting components – such as luminaires and electronic control gears (ECGs) – must comply with **EL standard requirements (EL mark).** The EL mark ensures that these components fulfill the specific requirements necessary for different emergency lighting systems.

## DC operation features

OPTOTRONIC 4DIM and DEXAL G2 OUTDOOR LED drivers are prepared for EL operation. The suitable AC/DC input voltages, inrush currents, EL parameters and dimming interfaces are shown on our Declaration of Conformity (DoC) Emergency Lighting landing page.

The EL mark on OPTOTRONIC 4DIM G3 and DEXAL G2 OUTDOOR LED is valid for both AC and DC emergency lighting. Tests are performed according to the IEC 61347-2-13 in DC mode, and results also cover the AC mode.

Luminaire manufacturers must fulfill the requirements according to the IEC 60598-2-22 (standard for luminaires for emergency lighting).

**Please note:**
LED drivers not intended to be approved for EL application have no EL mark. As the integrated OPTOTRONIC 4DIM and DEXAL G2 OUTDOOR driver fuse is not rated for DC operation, an external rated DC fuse is necessary. The proposed fuse type limits the surge withstand capability between line and neutral, but not the EQUI/PE.

The drivers are capable to detect DC operation. Using the Tuner4TRONIC® (T4T) software, the DC detection can be activated and the output level (called “emergency mode” level in the Tuner4TRONIC® software) in DC operation can be set. **During emergency operation (“emergency mode enabled and DC or rectified AC supply”), the DALI control functions, and the “end of life” feature are deactivated.** After returning to AC supply, the LED driver stays in the DALI mode until the next power-off/on cycle. The thermal protection, constant lumen and operating current features remain active.

The OPTOTRONIC® 4DIM and DEXAL G2 OUTDOOR LED driver families can be operated on a central battery system. The following topics need to be considered:

- Permitted DC input voltage range: 176 V – 276 $V_{DC}$
- Permitted AC input voltage range: 198 V – 264 $V_{AC}$
- Inrush current
- Dimming level in emergency mode

When our OPTOTRONIC® 4DIM and DEXAL G2 OUTDOOR LED driver families are in DC operating mode, the **fuse is not rated for DC operation** and an additional external fuse has to be installed in front of the LED driver.

Take, for example, the series 5x20 mm, time-lag rated for 3.15 A/500 VAC/400 VDC, VDE certificate no. 40025413. This fuse reduces the differential overvoltage protection.

By using an additional external surge protection device (SPD), the initial surge protection of the LED driver can be reestablished. The asymmetric overvoltage protection level to earth is maintained.

## DC supply power limitation

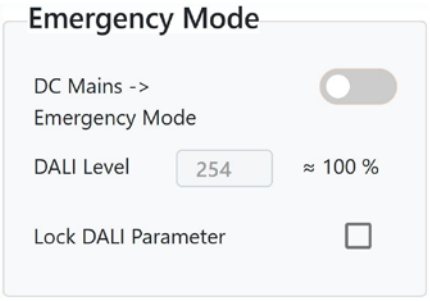
In DC operating mode, the **output power** is automatically limited to **75 %** of the maximum declared output to prevent thermal issues.

For example: A 100 W outdoor driver will be limited to around 75 W when running on DC voltage operation. This intrinsic limitation requires no configuration and is not a dimming feature, but a power restriction.

**Please note:** This aspect is not considered in Tuner4TRONIC (T4T).

## Emergency mode

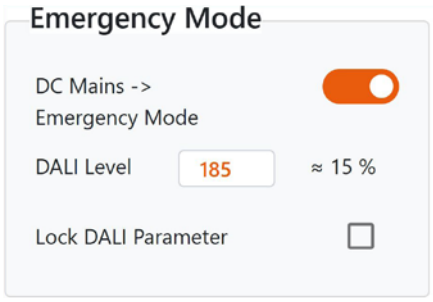
In the T4T default setting, the emergency mode of the outdoor drivers is not enabled. This means that the DC supply has no effect on the driver dimming level.




## Emergency mode enabled

**For example: DALI emergency level 15 %**

This feature configures the driver to dim to a specific dimming level, e.g. 15 %, if a DC supply (DC or rectified AC supply) is present. With DC supply, the driver will dim down to 15 %, independently from the load condition. The dimming level cannot be changed with **DALI commands.**




If the ""Lock DALI Parameter" is set in the T4T, **all DALI parameters are always locked in DC and B2-rectification of the AC voltage (without smoothing) – pulsating DC voltage – "joker voltage" operation (e.g. including addressing).**

**Please note:**

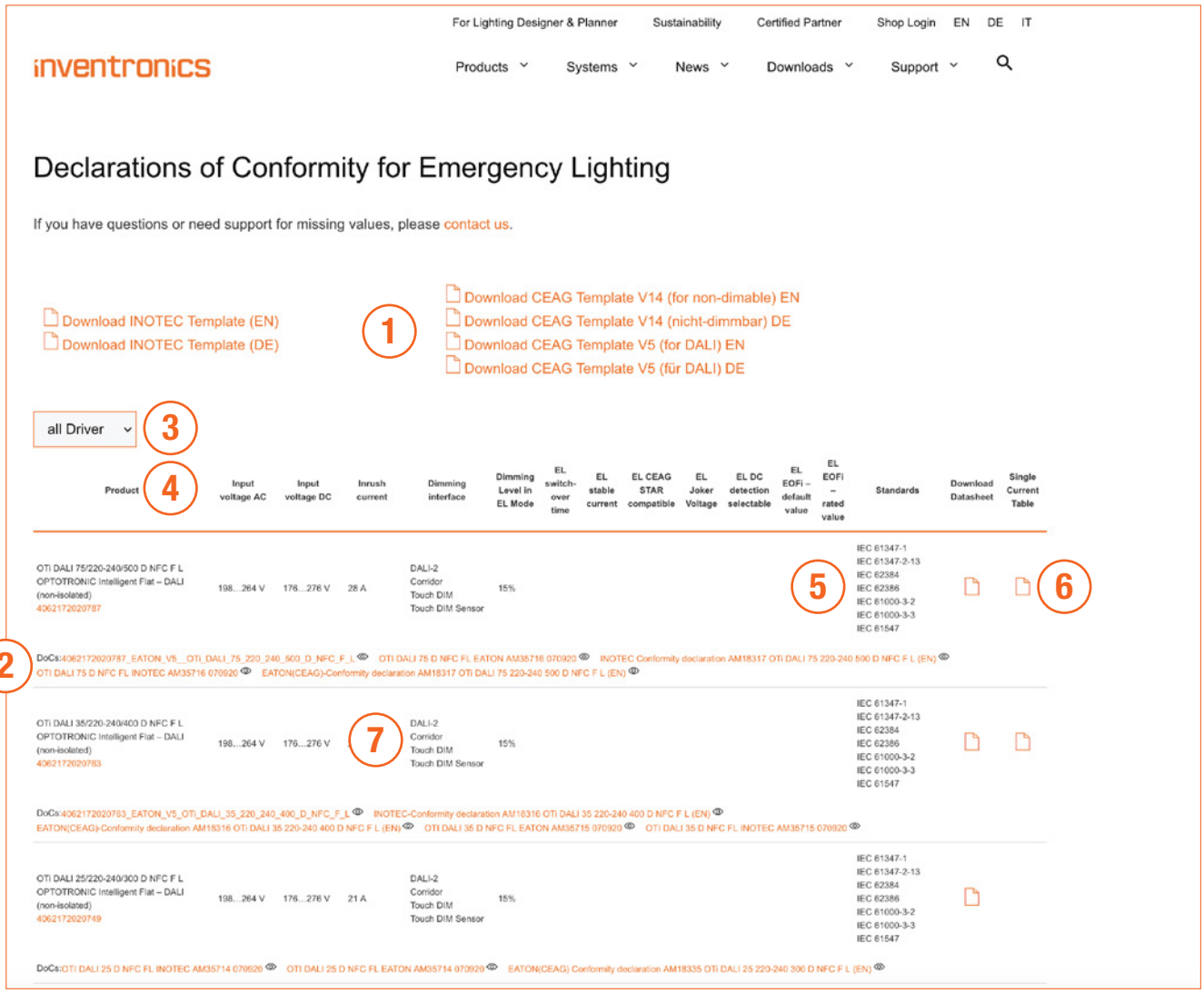
The output level in DC operation can be set using the Tuner4TRONIC® software. During DC operation, the DALI functions, the dimming modes and the "end of life" feature are deactivated.

For emergency operation mode, please ensure to fulfill the requirements according to IEC 60598-2-22 (standard for luminaires for emergency lighting) for your luminaire. The **Declaration of Conformity for Emergency Lighting** can be found here: **https://www.inventronics-light.com/declarations-of-conformity-for-emergency-lighting**

On our Declaration of Conformity for Emergency Lighting landing page, you can find all necessary information about our corresponding EL-marked LED drivers, e.g.:

**1** Current EATON/INOTEC form templates
**2** Available EATON/INOTEC forms
**3** Filter for all relevant EL-marked product families
**4** Important EL parameters
**5** Corresponding product standards
**6** Datasheets
**7** Operating point current tables

The EL forms are provided in the version available at the time of publication of the respective operating device. If you require a different version of the EL forms, you can find the parameters and data in the forms provided:




Simple search functions can be realized with the Windows shortcut "CTRL+F":

If available, the corresponding operating currents for different AC and DC input voltages can be called up for the products in the form of a table. This table can be used to fill in requirements in the EL forms.

This working point current table can also be attached to the respective forms. If you have any questions or need support for missing values, please feel free to contact us: **support@inventronicsglobal.com**

**Please note:**
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