# LC80SE-DA-250-1050-DUAL-LOOP

Helvar Components

## 80 W **SELV Dimmable DALI-2** LED driver

Product code: 5830

**2 x 40 W 220 – 240 V 0/ 50 – 60 Hz**

- DALI-2 certified LED driver
- Dual 40 W outputs for connecting two separate LED loads efficiently
- Doubled input terminals for looping the mains and DALI cables
- Driver can be used with both one and two loads with a single DALI address (DT6)
- D4i compatible Smart Data features (DALI 251-253)
- Powered DALI (default ON) and 18 V (current limited to 46 mA) auxiliary outputs for external sensors. Powered DALI follows DALI 250 standard
- Amplitude dimming for the highest quality flicker-free light output, complying with IEEE 1789 recommendations, 1-100 % dimming range
- NFC technology for wireless programming
- Product housing is made of recycled plastic
- Integrated spacious strain reliefs with screwless clamps, quick and simple installation process

EL 05 smart DATA CONSTANT LIGHT OUTPUT (CLO) CORRIDOR CONTROL NFC SWITCH-CONTROL 3 CE UK CA EAC SELV DALI 2

## Functional Description

- Adjustable constant current output: 250 mA to 1050 mA (500 mA default) per single output (max. 40 W / output)
- Latest technology Switch-Control 3 funtionality for easy-to-use intensity control
- Corridor Control for straightforward lighting control with e.g. external sensors with built-in relay
- Constant Light Output (CLO), adjustable up to 100 000 h (default disabled)
- Built-in adjustable internal thermal protection to actively reduce the output current in case of extreme temperatures

### Mains Characteristics

| | |
|---|---|
| Voltage range | 198 VAC – 264 VAC |
| | Withstands max. 320 VAC (max. 1 hour) |
| DC range | 176 VDC - 280 VDC |
| starting voltage | > 186 VDC |
| Mains current at full load | 0.4 A |
| Frequency | 0 / 50 Hz – 60 Hz |
| Stand-by power consumption | < 0.4 W* |
| | < 0.5 W** |
| THD at full power | < 7 % |
| Leakage current to earth | < 0.4 mA |
| Tested surge protection | 1 kV L-N, 2 kV L-GND (IEC 61000-4-5) |
| Tested fast transient protection | 2 kV (IEC 61000-4-4) |

*) When powered DALI and auxiliary 18 V power supplies are deactivated

**) When powered DALI and auxiliary 18 V power supplies are enabled

### Insulation between circuits & driver case

| | |
|---|---|
| Mains circuit - SELV circuit | Double/reinforced insulation |
| DALI circuit - SELV circuit | Double/reinforced insulation |
| Mains circuit - DALI circuit | Basic insulation |
| Mains, DALI and output - Driver case | Double/reinforced insulation |
| Mains input - Ground input | Basic insulation |
| DALI - Sensor 1 | Internally connected |
| DALI(-) - Sensor 1(-), Sensor 2(-) | Common negative internally connected |

### Load Output (SELV <60 V)

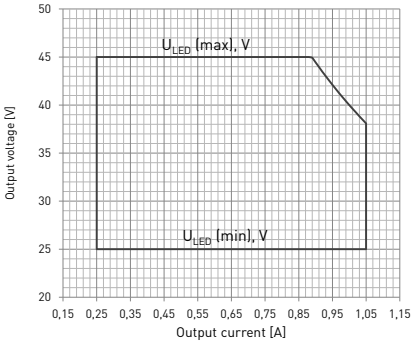
| | |
|---|---|
| Output current ($I_{out}$) | 250 mA – 1050 mA, 500 mA default |
| Accuracy | ± 5 % |
| Ripple | < 1 %* at ⩽ 120 Hz |
| PstLM | < 0.05** |
| SVM | < 0.005** |
| $U_{out}$ (max) (abnormal) | 60 V |

*) Low frequency, LED load: Cree XP-G LEDs

**) At full power

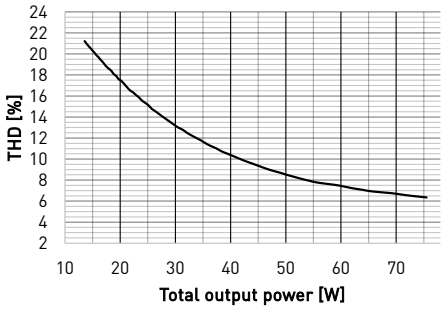
| $I_{LED}$ | 250 mA | 890 mA | 1050 mA |
|---|---|---|---|
| $P_{Rated}$ | 6...11 W | 22...40 W | 26...40 W |
| $U_{LED}$ | 25 - 45 V | 25 - 45 V | 25 - 38 V |
| PF (λ) at full load | 0.90 | 0.97 | 0.98 |
| Efficiency (η) at full load | 81 % | 91 % | 90 % |

## Operating window per single output



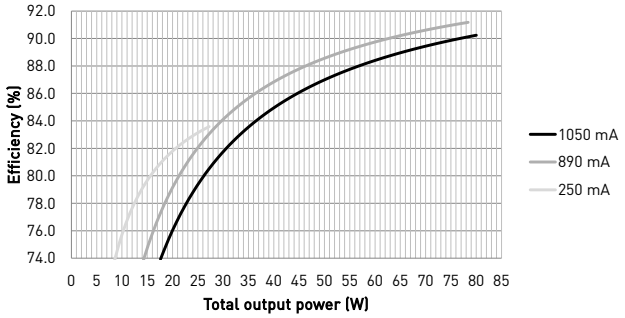

Note: Dimming between 1-100 % is possible across the operating window, restricted by the absolute minimum current of 5 mA.

### Current THD

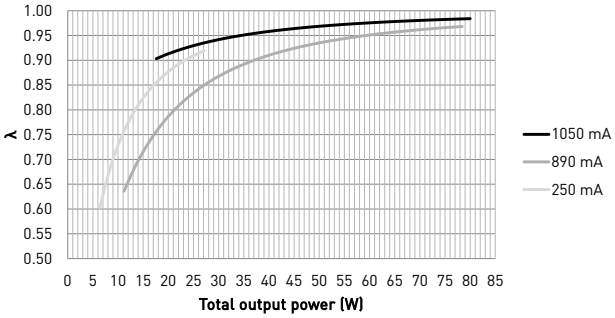



## Driver performance

### Typical efficiency




### Typical power factor




## Operating Conditions and Characteristics

| | |
|---|---|
| Absolute highest allowed $t_c$ point temperature | 85 °C |
| Tc life (50 000 h) temperature | 80 °C |
| Ambient temperature range | –25 °C … +45 °C* |
| Storage temperature range | –40 °C … +80 °C |
| Maximum relative humidity | No condensation |
| Life time (90 % survival rate) | 100 000 h, at $t_c$ = 70 °C<br>50 000 h, at $t_c$ = 80 °C<br>38 000 h, at $t_c$ = 85 °C |

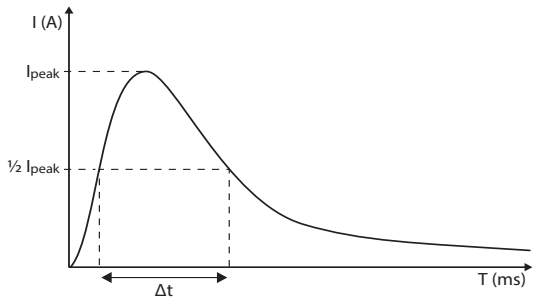
**) For other than independent use, higher $t_a$ of the controlgear possible as long as highest allowed $t_c$ point temperature is not exceeded*

## Quantity of drivers per miniature circuit breaker 16 A Type C

| Based on inrush current $I_{peak}$ | Typ. peak inrush current $I_{peak}$ | 1/2 value time, Δt | Calculated energy, $I_{peak}^2 \Delta t$ |
|---|---|---|---|
| 41 pcs. | 38 A | 162 µs | 0.169 $A^2s$ |

### CONVERSION TABLE FOR OTHER TYPES OF MINIATURE CIRCUIT BREAKER

| MCB type | Relative quantity of LED drivers |
|---|---|
| B 10 A | 37 % |
| B 16 A | 60 % |
| B 20 A | 75 % |
| C 10 A | 62 % |
| C 16 A | 100 % (see table above) |
| C 20 A | 125 % |

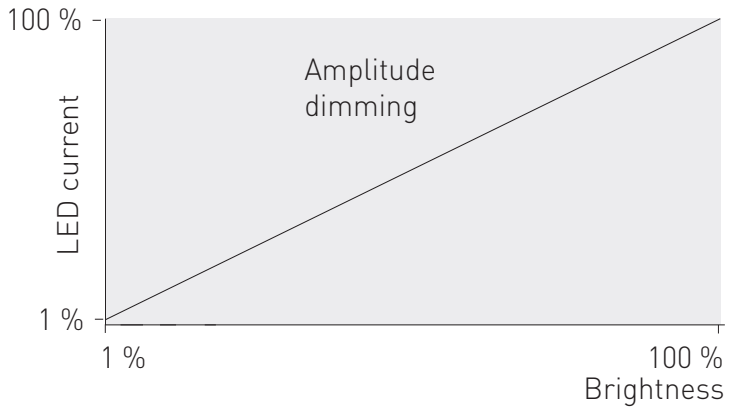



### CONTINOUS CURRENT

Total continous current of the drivers and installation environment must always be considered and taken into calculations when installing drivers behind miniature circuit breaker. Example calculation of total drivers amount limited by continous current: n($I_{cont}$) = (16 A ($I_{nom,Ta}$) / "nominal mains current with full load") x 0.76). This calculation is an example according to recommended precautions due to multiple adjacent circuit breakers (> 9 MCBs) and installation environment ($T_a$ 30 degrees); variables may vary according to the use case. Both inrush current and continous current calculations are based on ABB S200 series circuit breakers. More specific information in ABB series S200 circuit breaker documentation.

NOTE! Type C MCB's are strongly recommended to use with LED lighting. Please see more details in "MCB information" document in each driver product page in "downloads & links" section.

## Amplitude dimming technology




| Dimming range | Dimming technology |
|---|---|
| 1 % – 100 % | Amplitude (DC) |

LC80SE-DA-250-1050-DUAL-LOOP LED driver implements amplitude dimming technology across whole dimming range. Amplitude dimming offers the best available technology for dimming the light output in an accurate and flicker-free way to ensure high quality lighting in even the most demanding situations such as camera recording applications. Amplitude dimming technology complies with IEEE 1789-2015 recommendations of current modulation to mitigate health risks to viewers.

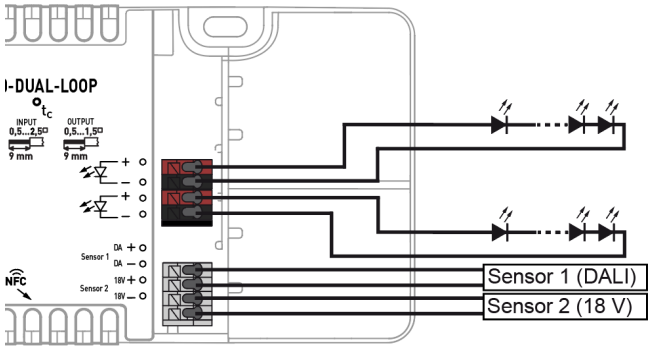
## Dual LED load and sensor power supply outputs

LC80SE-DA-250-1050-DUAL-LOOP LED driver includes two types of dual outputs integrated in the driver design itself.

Firstly, the LED driver offers two separate outputs for two similar LED loads, offering 2 x 40 W output power for LED module combinations inside the operating window specified in this datasheet. The innovative design of this technology allows the **forward voltages of LED loads to have up to 6 V of variation**, enabling this driver to act e.g. as a centralised power supply for two luminaire parts.

Secondly, ensuring the future-proofness of the luminaires, this LED driver integrates both powered DALI and 18 V constant voltage (current limited) auxiliary power supply outputs for sensors and other intelligent accessories.

Please note that the **power supply needs to be disabled and any sensors disconnected** when using Switch-Control 3 or Corridor Control!




## D4i-compatible Smart Data Features (DALI 251-253)

LC80SE-DA-250-1050-DUAL-LOOP LED driver has integrated Smart Data features, which monitor, gather and provide key data about the LED driver usage and internal parameters through DALI. This useful data provided by LED driver enables various applications and integrations into data management and IoT services, establishing the Helvar Components LED drivers as key components in the latest generation of smart luminaires.
The DALI parts 251-253 include:

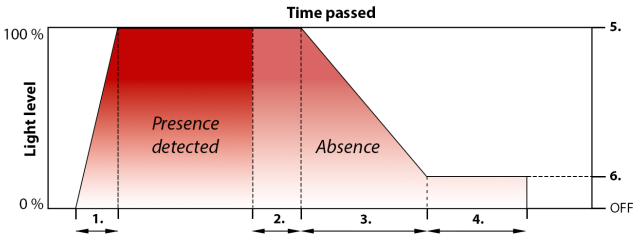
- OEM Customer data (DALI part 251)
- Energy reporting (DALI part 252)
- Diagnostics and maintenance (DALI part 253)

## Corridor Control

Corridor Control is a feature which enables simple and cost-efficient lighting control with relay-based PIR/multisensors. Corridor Control offers straightforward install-and-forget lighting control solution, ensuring increased energy efficiency, lighting comfort and added feeling of safety in various environments. Large base of available different 3rd party PIR sensors with relay can be used in implementing a Corridor Control installation on site.

By installing an external mains voltage sensor and connecting it to the DALI terminal, the driver adapts to preset default mode to increase the light level when presence is detected, while decreasing the light level when no one is nearby anymore. Please note that the internal **power supply needs to be disabled and any sensors disconnected** when using Switch-Control 3 or Corridor Control!

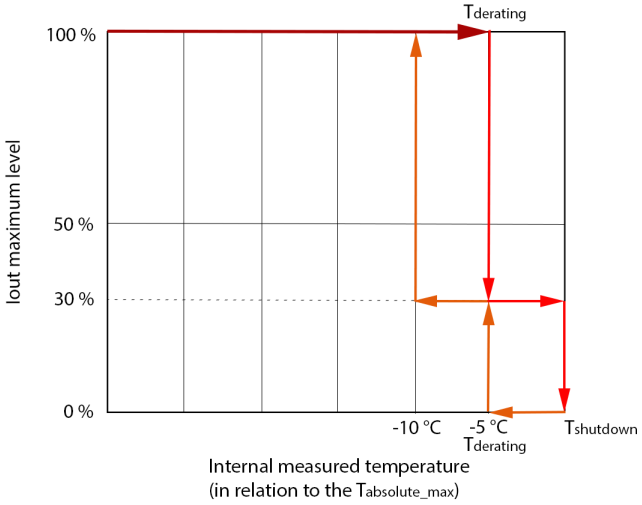
Corridor Control feature can be activated by connecting mains voltage in the DALI terminal for 55 seconds without interruption. Configuring the Corridor Control parameters is possible via Helvar Driver Configurator.




**1.** Fade in time
**2.** Presence light prolong time
**3.** Fade out time
**4.** Absence light period
**5.** Presence level
**6.** Absence level

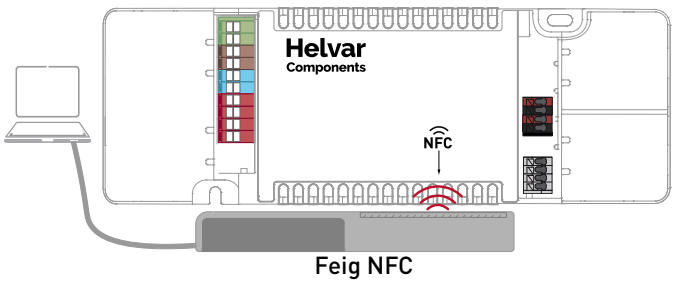
## Internal thermal protection

This LED driver has built-in active internal thermal protection. This feature protects the LED driver by limiting the maximum output current within one minute fade time when the temperature rises enough above the specified operating environment of the driver. If the temperature exceeds a certain predefined critical point, the output will be switched off and returns automatically once the temperature decreases below the threshold. The default behavior is shown in the graph on the right.
The exact triggering points vary depending of the LED driver model. By factory default, the derating point is adjusted high enough so that the feature should never be triggered below the point of Tc max temperature being exceeded and will thus not affect normal operation of the LED driver. Note that the internal measured temperature
does not equal Tc temperature of the driver!
Internal thermal protection feature is enabled by default, and it can be either disabled or manually adjusted to trigger earlier if desired. Configuring the internal thermal protection is done via Helvar Driver Configurator.




## Wireless configuration

LC80SE-DA-250-1050-DUAL-LOOP LED driver is equipped with NFC wireless technology for effortless configuration of the driver via Helvar Driver Configurator Support. Helvar Driver Configurator enables easy-to-use automatic configuration of the driver parameters via NFC, without mains or DALI connection to the driver. The most popular MD-SIG qualified NFC readers are supported giving flexibility for the operator. For further information about the usage with Helvar Driver Configurator, please see the user guide at www.helvarcomponents.com

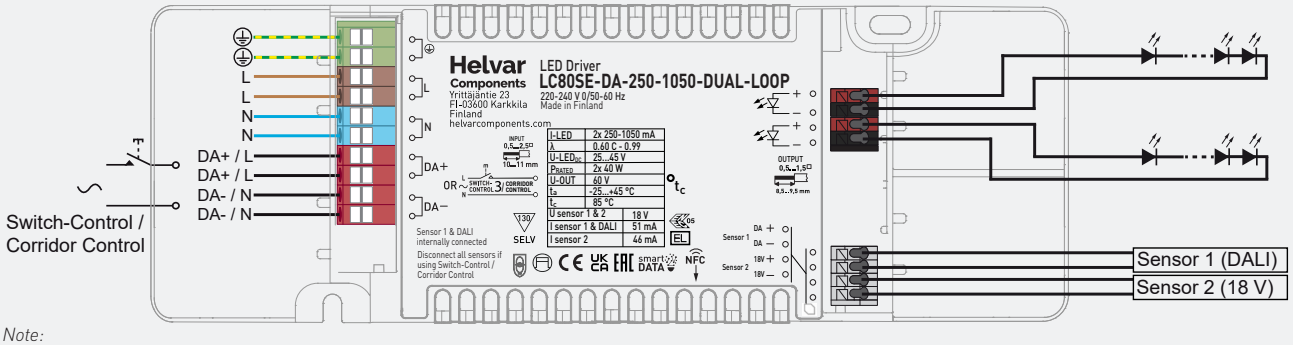



Feig NFC

## Connections and Mechanical Data

| | |
|---|---|
| Wire size | Input: 0.5 mm² – 2.5 mm²<br>Output: 0.5 mm² – 1.5 mm² |
| Wire type | Solid core and fine-stranded |
| Wire insulation | According to EN 60598 |
| Maximum current through looping terminals | 16 A |
| Maximum driver to LED wire length | 3 m |
| Weight | 262 g |
| IP rating | IP20 |

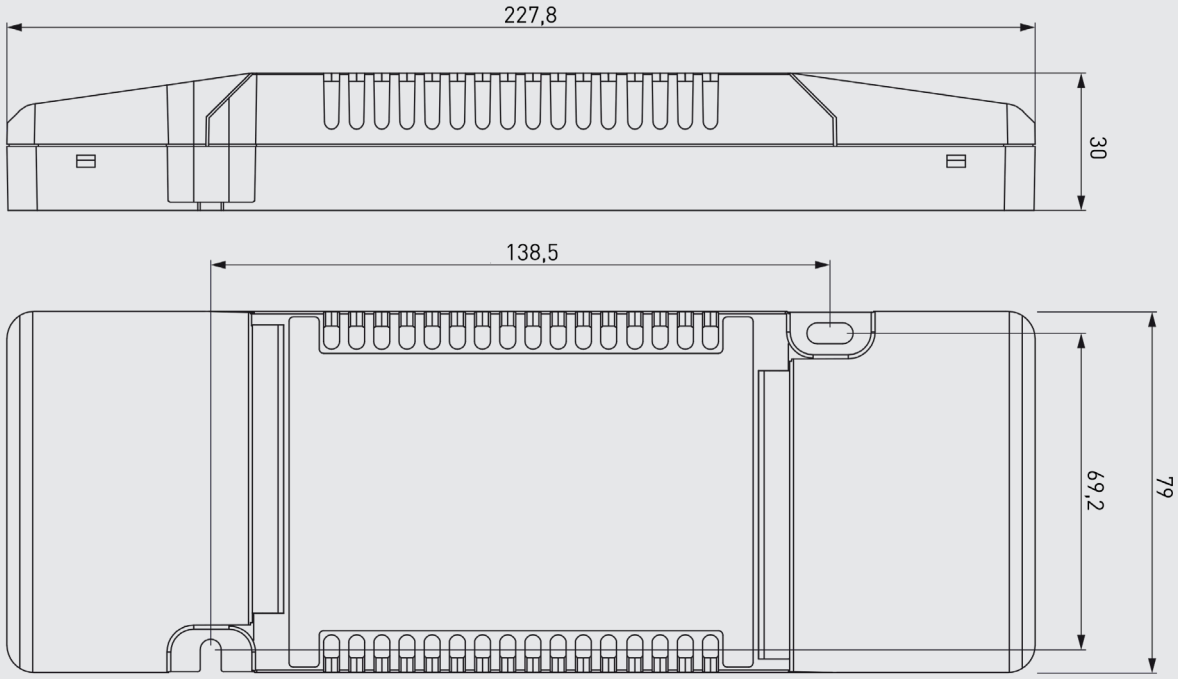
## Connections




*Note:*

- *PE terminal is for looping only and therefore earth connection is not needed for the functionality of the driver. See page 5 for details.*
- *When looping mains, only additional LED drivers shall be connected through the device terminals*
- *Not suitable for load side switching operation*

## Dimensions (mm)



LC80SE-DA-250-1050-DUAL-LOOP LED driver is suited for independent use and built-in usage in luminaires. In order to have safe and reliable LED driver operation, the LED luminaires will need to comply with the relevant standards and regulations (e.g. IEC/EN 60598-1). The LED luminaire shall be designed to adequately protect the LED driver from dust, moisture and pollution. The luminaire is not allowed to be covered with thermally insulating material. The luminaire manufacturer is responsible for the correct choice and installation of the LED drivers according to the application and product datasheets. Operating conditions of the LED drivers may never exceed the specifications as per the product datasheet.

## Installation & operation

**Maximum ambient and $t_c$ temperature**:

- For built-in components inside luminaires, the $t_a$ ambient temperature range is a guideline given for the optimum operating environment. However, integrator must always ensure proper thermal management (i.e. mounting base of the driver, air flow etc.) so that the $t_c$ point temperature does not exceed the $t_c$ maximum limit in any circumstance.
- Reliable operation and lifetime is only guaranteed if the maximum $t_c$ point temperature is not exceeded under the conditions of use.

**LED driver earthing**

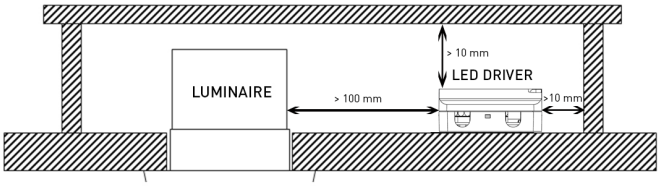
- LC80SE-DA-250-1050-DUAL-LOOP is Class I LED driver suitable for Class I and II luminaires, as well as driving Class III (SELV) luminaire parts in independent installation.
- If used inside **Class I** luminaires, the earth cable is not required for electrical safety in this driver. The PE connection is designed for earth signal looping between drivers.
- If used inside **Class II** luminaires, the safety of the luminaire shall be ensured through double/reinforced insulation of live parts. LC80SE-DA-250-1050-DUAL-LOOP has double/reinforced insulation between accessible and live parts, and is suitable for use in all Class II luminaires. In this case the earth terminal of the driver must be left unconnected and the luminaire terminal block shall not have any protective earthing terminal.
- If used in **independent** installation with Class I/II/III luminaires, the earth cable is not required to be connected. The PE connection is designed for earth signal looping between drivers.

**Miniature Circuit Breakers (MCB)**

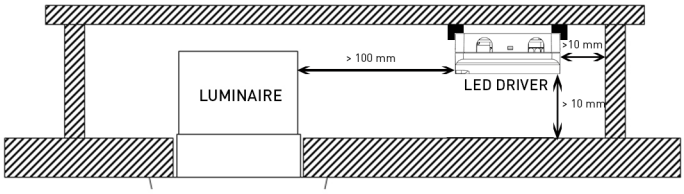
- Type-C MCB's with trip characteristics in according to EN 60898 are recommended.
- Please see more details in "MCB information" document in each driver product page in "downloads & links" section.

**Installation site**

- The general preferred installation position of LED drivers for independent use is to have the top cover facing upwards.
- Minimum recommended distances below:




- Suitable for installation upside down and in the corner, in this case separate spacers must be used. For more information, please consult Helvar Components.




## Helvar Driver Configurator -support

LC80SE-DA-250-1050-DUAL-LOOP LED driver is supported by Helvar Driver configurator software. The output current of the driver can be programmed using Helvar Driver Configurator, as well as parameters for functions such as CLO, Internal Thermal Protection or toggling DALI power on/off. Programming the driver with Helvar Driver Configurator can be done either wirelessly via NFC or then via DALI bus.

## Lamp failure functionality

**No load**

When open load is detected, the driver will go to standby mode and remain in automatic recovery status. In automatic recovery mode, the driver will check every four seconds if the load has been reconnected. Once that happens, it returns to normal operation.

**Short circuit**

When short circuit is detected, driver will go to standby mode. It will return to normal operation through DALI light level OFF -> ON command or through mains reset.

**Overload**

When overload/voltage is detected, driver will act similarly to no load situation. It will go to standby mode and remain in automatic recovery status. In automatic recovery mode, the driver will check every four seconds if the load has been reconnected. Once that happens, it returns to normal operation.

**Underload**

When underload/voltage is detected, driver will act similarly to short circuit situation, it will go to standby power consumption status. It will return to normal operation through DALI light level OFF -> ON command or through mains reset.

**AC to DC emergency lighting mode**

When AC supply is switched to DC, driver will recognise this and switch to emergency lighting mode. The light level will be adjusted to 15 % of the nominal AC operation output current by default. The DC light level cannot be adjusted or turned off by manual control or by active features, unless "DC dimming" is specifically enabled through Helvar Driver Configurator. When the AC is switched back on, the driver returns to normal operation.

Note: The internal temperature protection feature can never force the light level off or below the set emergency level in DC emergency mode.

## Switch-Control 3

Before installation and for troubleshoot and guidance, refer to Switch-Control & Direct Control User Guide at www.helvarcomponents.com.

Please note that the **power supply needs to be disabled and any sensors disconnected** when using Switch-Control 3 or Corridor Control!

**Use of Switch-Control functionality**

- Maximum numbers of LED drivers to be connected to one switch is 60. Wire length is not restricted by the driver technology.
- Power on to last level mode is enabled by default, ensuring that the driver returns to the last memorized light level before mains interruption in cases of e.g. power outages.
- Ensure that all components connected to Switch-Control circuitry are mains rated.
- If needed, the synchronisation of light levels in the Switch-Control circuit can be carried out by either of the two options:
  - Press and hold the Switch-Control switch until all lights are ON. Then switch all lights OFF with a short press.
  - Press and hold the Switch-Control switch for 10 seconds without interruption.

**Use of Corridor Control**

- Activate Corridor Control feature by connecting mains voltage to the DALI terminal for 55 seconds without interruption.
- Disable Corridor Control feature by giving exactly 5 short mains voltage signal pulses (less the 350 ms) to the DALI terminal within 3 seconds.
- Ensure that all components connected to Corridor Control circuitry are mains rated.
- Default settings are described in the User Guide.

See more details in Switch-Control and Corridor Control User Guides at www.helvarcomponents.com.

## Conformity & standards

| | |
|---|---|
| General and safety requirements | EN 61347-1 |
| Particular safety requirements for DC or AC supplied electronic control gear for LED modules | EN 61347-2-13 |
| Additional safety requirements for AC or DC supplied electronic controlgear for emergency lighting | EN 61347-2-13, Annex J |
| Thermal protection class | EN 61347, C5e |
| Mains current harmonics | EN 61000-3-2 |
| Limits for voltage fluctuations and flicker | EN 61000-3-3 |
| Radio frequency interference | EN 55015 |
| Immunity standard | EN 61547 |
| Performance requirements | EN 62384 |
| **Digital addressing lighting interface:** | |
| General requirements for DALI system | EN 62386-101 (DALI-2) |
| Requirements for DALI control gear | EN 62386-102 (DALI-2) |
| Requirements for control gear of LED modules (DALI Device Type 6) | EN 62386-207 (DALI-2) |
| Powered DALI (Sensor 1) | DALI Part 250 |
| Memory Bank 1 extension | DALI Part 251 |
| Energy Reporting | DALI Part 252 |
| Diagnostics & Maintenance | DALI Part 253 |
| Recommended Practices for Modulating Current in High-Brightness LEDs for Mitigating Health Risks to Viewers | IEEE 1789-2015 |
| Compliant with relevant EU directives | |
| RoHS/REACH compliant | |
| ENEC and CE / UKCA marked | |

## Symbols

Safety isolating control gear with short circuit protection (SELV control gear).


DALI-2 certified control gear.


Driver equipped with NFC wireless technology for effortless configuration.


Driver is capable of monitoring and measuring key data about driver usage and providing access to that data via DALI, complying with DALI parts 251-253. This includes data sets such as OEM customer data, energy reporting and diagnostics.


AC/DC supplied electronic control gear for emergency lighting purposes intended for connection to a centralized emergency power supply.

The product is not allowed to be covered with thermally insulating material according to IEC 60598-1 (ed. 8.0)b.