Product description
- Self-contained emergency lighting LED driver with DALI interface
- Non maintained operation
- For LED modules with a forward voltage of 10 – 54 V
- SELV for output voltage < 60 V DC
- For luminaire installation
- Compatible with Tridonic’s LLE FLEX modules (ADV, EXC)
- Nominal lifetime up to 100,000 h
- 5 years guarantee (conditions at www.tridonic.com)

Functions
- 1, 2 or 3 h rated duration selectable with duration link
- Constant power output
  - Self-test
- Weekly function test
- Yearly duration test

Driver compatibility
- 3-pole technology: 2-pole LED module changeover and delayed power switching for the LED driver
- For further information see chapter „LED driver compatibility“

Battery management
- Intelligent charge system
- Deep discharge protection
- Polarity reversal protection for battery

Batteries
- NiCd or NiMH batteries
- 4-year design life
- 1-year guarantee
- For battery compatibility refer to chapter „Battery selection“

Standards, page 5
Wiring diagrams and installation examples, page 6
## Technical data

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated supply voltage</td>
<td>220 – 240 V</td>
</tr>
<tr>
<td>AC voltage range</td>
<td>198 – 264 V</td>
</tr>
<tr>
<td>Mains frequency</td>
<td>50 / 60 Hz</td>
</tr>
<tr>
<td>LED module forward voltage range</td>
<td>10 – 54 V</td>
</tr>
<tr>
<td>Output current</td>
<td>see chapter 5.2</td>
</tr>
<tr>
<td>Starting time</td>
<td>&lt; 0.5 s from detection of emergency event</td>
</tr>
<tr>
<td>Overvoltage protection</td>
<td>320 V (for 48 h)</td>
</tr>
<tr>
<td>U-OUT (including open / short-circuit and double load)</td>
<td>60 V</td>
</tr>
<tr>
<td>Max. open circuit voltage</td>
<td>60 V</td>
</tr>
<tr>
<td>Ambient temperature range ta</td>
<td>-25 ... +55 °C</td>
</tr>
<tr>
<td>Max. casing temperature tc</td>
<td>80 °C</td>
</tr>
<tr>
<td>Mains voltage changeover threshold</td>
<td>according to EN 60598-2-22</td>
</tr>
<tr>
<td>Mains surge capability (between L – N)</td>
<td>1 kV</td>
</tr>
<tr>
<td>Mains surge capability (between L/N – PE)</td>
<td>2 kV</td>
</tr>
<tr>
<td>Type of protection</td>
<td>IP20</td>
</tr>
<tr>
<td>Rest mode max. number of emergency units</td>
<td>100</td>
</tr>
<tr>
<td>Rest mode max. wiring distance</td>
<td>1000 m</td>
</tr>
<tr>
<td>Functional test</td>
<td>Weekly 5s test</td>
</tr>
<tr>
<td>Duration test</td>
<td>Yearly 1h / 2h / 3h test</td>
</tr>
<tr>
<td>Lifetime</td>
<td>up to 100,000 h</td>
</tr>
<tr>
<td>Guarantee (conditions at <a href="http://www.tridonic.com">www.tridonic.com</a>)</td>
<td>5 years</td>
</tr>
<tr>
<td>Dimensions LxWxH</td>
<td>179 x 30 x 21 mm</td>
</tr>
</tbody>
</table>

## Specific technical data

### EM converterLED PRO 202 NiCd/NiMH 50 V

<table>
<thead>
<tr>
<th>Type</th>
<th>Rated duration</th>
<th>Typ λ (at 230 V, 50 Hz)</th>
<th>Typ output power Pemergency</th>
<th>Mains current in charging operation</th>
<th>Rated power in charging operation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Initial charge</td>
<td>Fast recharge</td>
</tr>
<tr>
<td>EM converterLED PRO 202 NiCd/NiMH 50 V</td>
<td>1 h</td>
<td>0.60C 15 W</td>
<td>15 mA</td>
<td>16 mA</td>
<td>15 mA</td>
</tr>
<tr>
<td></td>
<td>2 h</td>
<td>0.55C 15 W</td>
<td>19 mA</td>
<td>19 mA</td>
<td>15 mA</td>
</tr>
<tr>
<td></td>
<td>3 h</td>
<td>0.50C 15 W</td>
<td>19 mA</td>
<td>19 mA</td>
<td>15 mA</td>
</tr>
</tbody>
</table>

### EM converterLED PRO 203 NiCd/NiMH 50 V

<table>
<thead>
<tr>
<th>Type</th>
<th>Rated duration</th>
<th>Typ λ (at 230 V, 50 Hz)</th>
<th>Typ output power Pemergency</th>
<th>Mains current in charging operation</th>
<th>Rated power in charging operation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Initial charge</td>
<td>Fast recharge</td>
</tr>
<tr>
<td>EM converterLED PRO 203 NiCd/NiMH 50 V</td>
<td>1 h</td>
<td>0.60C 2.5 W</td>
<td>16 mA</td>
<td>18 mA</td>
<td>15 mA</td>
</tr>
<tr>
<td></td>
<td>2 h</td>
<td>0.70C 2.5 W</td>
<td>20 mA</td>
<td>20 mA</td>
<td>16 mA</td>
</tr>
<tr>
<td></td>
<td>3 h</td>
<td>0.70C 2.5 W</td>
<td>20 mA</td>
<td>20 mA</td>
<td>16 mA</td>
</tr>
</tbody>
</table>

### EM converterLED PRO 204 NiCd/NiMH 50 V

<table>
<thead>
<tr>
<th>Type</th>
<th>Rated duration</th>
<th>Typ λ (at 230 V, 50 Hz)</th>
<th>Typ output power Pemergency</th>
<th>Mains current in charging operation</th>
<th>Rated power in charging operation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Initial charge</td>
<td>Fast recharge</td>
</tr>
<tr>
<td>EM converterLED PRO 204 NiCd/NiMH 50 V</td>
<td>1 h</td>
<td>0.60C 3.5 W</td>
<td>17 mA</td>
<td>20 mA</td>
<td>14 mA</td>
</tr>
<tr>
<td></td>
<td>2 h</td>
<td>0.70C 3.5 W</td>
<td>23 mA</td>
<td>23 mA</td>
<td>17 mA</td>
</tr>
<tr>
<td></td>
<td>3 h</td>
<td>0.70C 3.5 W</td>
<td>23 mA</td>
<td>23 mA</td>
<td>17 mA</td>
</tr>
</tbody>
</table>

Note: LED driver supplied with duration link in 3 hours position. Duration link must be set before battery and mains connection.

### Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Article number</th>
<th>Rated duration</th>
<th>Packaging, carton</th>
<th>Packaging, pallet</th>
<th>Weight per pc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>EM converterLED PRO 202 NiCd/NiMH 50 V</td>
<td>89800649</td>
<td>1/2/3 h</td>
<td>10 pc(s)</td>
<td>1,600 pc(s)</td>
<td>0.073 kg</td>
</tr>
<tr>
<td>EM converterLED PRO 203 NiCd/NiMH 50 V</td>
<td>89800650</td>
<td>1/2/3 h</td>
<td>10 pc(s)</td>
<td>1,600 pc(s)</td>
<td>0.073 kg</td>
</tr>
<tr>
<td>EM converterLED PRO 204 NiCd/NiMH 50 V</td>
<td>89800651</td>
<td>1/2/3 h</td>
<td>10 pc(s)</td>
<td>1,600 pc(s)</td>
<td>0.073 kg</td>
</tr>
</tbody>
</table>
Product description

- Optional strain-relief set for independent applications
- Transforms the LED driver into a fully class II compatible LED driver (e.g. ceiling installation)
- Easy and tool-free mounting to the LED driver, screwless cable-clamp channels with strain-relief (240 x 43 x 30 mm)

Permissible cable jacket diameter 2.2 – 9 mm

Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Article number</th>
<th>Packaging, carton</th>
<th>Packaging, pallet</th>
<th>Weight per pc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMcLED SR</td>
<td>28003813</td>
<td>10 pc(s)</td>
<td>1,260 pc(s)</td>
<td>0.08 kg</td>
</tr>
</tbody>
</table>
Test switch EM3

Product description

- For connection to the emergency lighting unit
- For checking the device function
- Plug connection

Ordering data

<table>
<thead>
<tr>
<th>Type</th>
<th>Article number</th>
<th>Packaging, bag</th>
<th>Packaging, carton</th>
<th>Weight per pc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test switch EM 3</td>
<td>89899956</td>
<td>25 pc(s)</td>
<td>200 pc(s)</td>
<td>0.013 kg</td>
</tr>
</tbody>
</table>

LED EM bi-colour, 1.0 m CON

<table>
<thead>
<tr>
<th>Type</th>
<th>Article number</th>
<th>Packaging, bag</th>
<th>Packaging, carton</th>
<th>Weight per pc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>LED EM bi-colour, high brightness HO 1.0 m CON</td>
<td>89800273</td>
<td>25 pc(s)</td>
<td>200 pc(s)</td>
<td>0.015 kg</td>
</tr>
<tr>
<td>LED EM bi-colour, 0.6 m CON</td>
<td>89800474</td>
<td>25 pc(s)</td>
<td>200 pc(s)</td>
<td>0.005 kg</td>
</tr>
<tr>
<td>LED EM bi-colour, high brightness HO 0.6 m CON</td>
<td>89800475</td>
<td>25 pc(s)</td>
<td>200 pc(s)</td>
<td>0.005 kg</td>
</tr>
<tr>
<td>LED EM bi-colour, 0.3 m CON</td>
<td>89800274</td>
<td>25 pc(s)</td>
<td>200 pc(s)</td>
<td>0.005 kg</td>
</tr>
<tr>
<td>LED EM bi-colour, high brightness HO 0.3 m CON</td>
<td>89800276</td>
<td>25 pc(s)</td>
<td>200 pc(s)</td>
<td>0.005 kg</td>
</tr>
</tbody>
</table>
1. Standards

- EN 61347-1
- EN 61347-2-13
- EN 61347-2-7
- EN 55015
- EN 61000-3-2
- EN 61000-3-3
- EN 61547
- EN 60068-2-64
- EN 60068-2-29
- EN 60068-2-30
- EN 62386
- according to EN 50172
- according to EN 60598-2-22
- according to EN 61547
- according to EN 60068-2-26
- according to EN 60068-2-29
- according to EN 60068-2-30
- according to EN 62386

Meaning of marking:

Double or reinforced insulation for built-in electronic LED drivers. The control gear relies upon the luminaire enclosure for protection against accidental contact with live parts.

1.1 Glow-wire test

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

1.2 Insulation and electric strength testing of luminaires

Electronic LED-Drivers 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 1,500 V AC (or 1,414 x 1,500 V DC). To avoid damage to the electronic devices this test must not be conducted.

2. Thermal details and lifetime

2.1 Lifetime

Average lifetime 50,000 hours under rated conditions with a failure rate of less than 10 % Average failure rate of 0.2 % per 1000 operating hours.

Expected lifetime

<table>
<thead>
<tr>
<th>EM converterLED PRO 202</th>
<th>tc 65 °C</th>
<th>70 °C</th>
<th>75 °C</th>
<th>80 °C</th>
</tr>
</thead>
<tbody>
<tr>
<td>NICD/NIMH 50V</td>
<td>lifetime</td>
<td>100,000 h</td>
<td>100,000 h</td>
<td>90,000 h</td>
</tr>
<tr>
<td>EM converterLED PRO 203</td>
<td>tc 65 °C</td>
<td>70 °C</td>
<td>75 °C</td>
<td>80 °C</td>
</tr>
<tr>
<td>NICD/NIMH 50V</td>
<td>lifetime</td>
<td>100,000 h</td>
<td>100,000 h</td>
<td>83,000 h</td>
</tr>
<tr>
<td>EM converterLED PRO 204</td>
<td>tc 65 °C</td>
<td>70 °C</td>
<td>75 °C</td>
<td>80 °C</td>
</tr>
<tr>
<td>NICD/NIMH 50V</td>
<td>lifetime</td>
<td>100,000 h</td>
<td>100,000 h</td>
<td>82,000 h</td>
</tr>
</tbody>
</table>

The emergency lighting 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 Wiring diagrams

One or more LED modules with a total forward voltage of 10 to 54 V can be connected to the EM converterLED module. These LED module(s), marked with “Emergency” are operated in emergency mode from the associated battery. In normal mains mode all LED modules are operated by the mains LED driver.
EM converterLED PRO with one LED module for non-maintained emergency operation

EM converterLED PRO with a standard LED driver and one LED module for mains and emergency operation

EM converterLED PRO with a standard LED driver and series operation of LED modules

One LED module is operated in emergency mode.
All LED modules are operated in mains mode.
EM converterLED PRO with a standard LED driver and parallel operation of LED modules

One LED module is operated in emergency mode.
All LED modules are operated in mains mode.

Wireless set-up for EM converterLED PRO with a standard LED driver and one LED module for mains and emergency operation

* For further information see basicDIM Wireless datasheet at www.tridonic.com
Wireless set-up for EM converterLED PRO with a DALI LED driver and one LED module for mains and emergency operation
3.2 Wiring type and cross section
Solid wire with a cross section of 0.5 – 1.5 mm². Strip 8 – 9 mm of insulation from the cables to ensure perfect operation of terminals.

3.3 Loose wiring
Loosen wire through twisting and pulling or using a Ø1 mm release tool

3.4 Wiring guidelines
• The output to the LED is DC but has high frequency content, which should be considered for good EMC compliance.
• Separate LED leads from the mains and DALI connections and wiring for good EMC performance.
• Maximum lead length on the LED terminals is 3 m. For a good EMC performance keep the LED wiring as short as possible.
• Route the secondary wires (LED module) in parallel to ensure good EMC performance.
• Maximum lead length for the Test switch and Indicator LED connection is 1 m. Separate the test switch and Indicator LED wiring from the LED leads to prevent noise coupling.
• Battery leads are specified with 0.5 mm cross section and a length of 0.8 m.
• DALI terminals are mains proof.
• Protect the wiring against short circuits to earth (sharp edged metal parts, metal cable clips, louver, etc.) to avoid the damage of the control gear.

To ensure that a luminaire containing LED emergency units complies with EN 55015 for radio frequency conducted interference in both normal and emergency mode it is essential to follow good practice in the wiring layout.

Within the luminaire route the switched and unswitched 50 Hz supply wiring as short as possible and keep it as far away as possible from the LED leads. Through wiring may affect the EMC performance of the luminaire.

Do not exceed the max. length of LED leads to the LED module. Note that the length of the EM converterLED leads to the LED module is added to the length of the leads from the LED driver to the EM converterLED module when considering the max. permitted lead length of the LED driver.

3.5 Maximum lead length
- LED 3 m
- Status indication LED 1 m
- Batteries 0.8 m

3.6 Use of different phases
The use of different phases for switched line and unswitched line is allowed. When using different phases, the unswitched line must fail if the switched line fails. This is required to assure correct switching into emergency mode. It can be realised with a relay.

3.7 Compatibility with LLE FLEX modules
The EM converterLED can be used within certain restrictions to operate constant voltage LED loads from the Tridonic LLE FLEX (ADV, EXC) product range. A certain minimum length of the LLE FLEX is required for correct operation. Detailed information in the download area of the ST and PRO product pages at www.tridonic.com (EM converterLED manual).

4. Mechanical values

4.1 Housing properties
• Casing manufactured from polycarbonate.
• Type of protection: IP20

4.2 Mechanical data accessories

LED status indicator
• Bi-colour
• Mounting hole 6.5 mm diameter, 1 – 1.6 mm thickness
• Lead length 0.3 m / 1.0 m
• Insulation rating: 90 °C
• Plug connection

Test switch
• Mounting hole 7.0 mm diameter
• Lead length 0.55 m
• Plug connection

Battery connection
• Plug connection 0.3 m
• Extension 0.5 m

3.7 Compatibility with LLE FLEX modules
The EM converterLED can be used within certain restrictions to operate constant voltage LED loads from the Tridonic LLE FLEX (ADV, EXC) product range. A certain minimum length of the LLE FLEX is required for correct operation. Detailed information in the download area of the ST and PRO product pages at www.tridonic.com (EM converterLED manual).

4. Mechanical values

4.1 Housing properties
• Casing manufactured from polycarbonate.
• Type of protection: IP20

4.2 Mechanical data accessories

LED status indicator
• Bi-colour
• Mounting hole 6.5 mm diameter, 1 – 1.6 mm thickness
• Lead length 0.3 m / 1.0 m
• Insulation rating: 90 °C
• Plug connection

Test switch
• Mounting hole 7.0 mm diameter
• Lead length 0.55 m
• Plug connection

Battery connection
• Plug connection 0.3 m
• Extension 0.5 m

3.7 Compatibility with LLE FLEX modules
The EM converterLED can be used within certain restrictions to operate constant voltage LED loads from the Tridonic LLE FLEX (ADV, EXC) product range. A certain minimum length of the LLE FLEX is required for correct operation. Detailed information in the download area of the ST and PRO product pages at www.tridonic.com (EM converterLED manual).
5. Electrical values

5.1 Maximum loading of automatic circuit breakers

<table>
<thead>
<tr>
<th>Automatic circuit breaker type</th>
<th>B10</th>
<th>B13</th>
<th>B16</th>
<th>B20</th>
<th>C10</th>
<th>C13</th>
<th>C16</th>
<th>C20</th>
<th>Inrush current</th>
<th>I&lt;sub&gt;max&lt;/sub&gt; time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation Ø</td>
<td>1.5 mm²</td>
<td>1.5 mm²</td>
<td>1.5 mm²</td>
<td>2.5 mm²</td>
<td>1.5 mm²</td>
<td>1.5 mm²</td>
<td>1.5 mm²</td>
<td>2.5 mm²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EM converterLED PRO NiCd/NiMH 50V</td>
<td>90</td>
<td>130</td>
<td>130</td>
<td>180</td>
<td>260</td>
<td>260</td>
<td>260</td>
<td>10 A</td>
<td>120 μs</td>
<td></td>
</tr>
</tbody>
</table>

5.2 Insulation matrix

<table>
<thead>
<tr>
<th></th>
<th>Mains</th>
<th>Switched Live</th>
<th>Battery, LED, Test switch, Indicator LED</th>
<th>DALI</th>
<th>LED driver</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mains</td>
<td>–</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Switched Live</td>
<td>•</td>
<td>–</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Battery, LED, Test switch, Indicator LED</td>
<td>• •</td>
<td>• •</td>
<td>–</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>DALI</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>–</td>
<td>• •</td>
</tr>
<tr>
<td>LED driver</td>
<td>• •</td>
<td>• •</td>
<td>–</td>
<td>• •</td>
<td>–</td>
</tr>
</tbody>
</table>

• Represents basic insulation
• • Represents double or reinforced insulation

When using a non-SELV LED driver insulate the battery, LED, test switch and indicator LED in the luminaire according to the U-OUT rating of the LED driver. DALI terminals are not SELV. Wire the terminals in accordance with the requirements of low voltage installations.
5.3 Typ. LED current/voltage characteristics

The LED current in emergency mode is automatically adjusted by the EM converterLED module based on the total forward voltage of the LED modules connected and the associated battery. The start of the LED in emergency mode does not result in a current peak.

EM converterLED PRO 202 NiCd/NiMH 50V
Article number: 89800649
2.4 V battery voltage
730 – 790 mA battery discharge current (tolerance)

EM converterLED PRO 203 NiCd/NiMH 50V
Article number: 89800650
3.6 V battery voltage
780 – 840 mA battery discharge current (tolerance)

EM converterLED PRO 204 NiCd/NiMH 50V
Article number: 89800651
4.8 V battery voltage
800 – 860 mA battery discharge current (tolerance)
5.4 LED driver compatibility

The EM converterLED emergency unit uses 3 pole technology and is compatible with most LED drivers on the market; however, it is important to check that the rating of the LED driver does not exceed the values specified below:

- The max. allowed output current rating of the associated LED driver is 2 A eff (current rating of the terminals of EM converterLED) and 2.4 A peak (current rating of switching relays of EM converterLED)
- The max. allowed inrush current rating of the associated LED driver is 60 A peak for 1 ms or 84 A for 255 μs (inrush current rating of switching relay of EM converterLED)
- The max. allowed output voltage (U-OUT) of the associated LED driver applied to the EM converterLED output is 450 V (voltage withstand between adjacent contact of the single switching relay of the EM converterLED)
- The max. allowed LED load of the associated LED driver is 150 W in operation. The load must be an LED module.

6. Functions

6.1 Duration link selection

<table>
<thead>
<tr>
<th>Duration</th>
<th>Link position</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 hr</td>
<td>Position A</td>
</tr>
<tr>
<td>2 hr</td>
<td>Position B</td>
</tr>
<tr>
<td>1 hr</td>
<td>No duration link</td>
</tr>
</tbody>
</table>

Emergency lighting LED driver supplied with duration link in 3 hours position (position A).

The position of the link will only be read on first power up. If it is changed afterwards both the battery and mains supply must be disconnected for 10 seconds to enable the EM converterLED to read the new link position on reconnection of the battery and mains. It will lead to a false battery failure indication if the link is changed after installation without this reset.

6.2 Status indication

System status is indicated by a bi-colour LED and by a DALI status flag.

<table>
<thead>
<tr>
<th>LED indication</th>
<th>Status</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permanent green</td>
<td>System OK</td>
<td>AC mode</td>
</tr>
<tr>
<td>Fast flashing green</td>
<td>Function test</td>
<td>0 sec on – 0 sec off</td>
</tr>
<tr>
<td>Slow flashing green</td>
<td>Duration test</td>
<td>0 sec on – 1 sec off</td>
</tr>
<tr>
<td>Red LED on</td>
<td>Load failure</td>
<td>Open circuit / Short circuit / LED failure</td>
</tr>
<tr>
<td>Slow flashing red</td>
<td>Battery failure</td>
<td>1 sec on – 1 sec off</td>
</tr>
<tr>
<td>Fast flashing red</td>
<td>Charging failure</td>
<td>0 sec on – 0 sec off</td>
</tr>
<tr>
<td>Double pulsing green</td>
<td>Inhibit mode</td>
<td>Switching into inhibit mode via controller</td>
</tr>
<tr>
<td>Binary transmission of address via green/red LED</td>
<td>Address identification</td>
<td>During address identification mode</td>
</tr>
<tr>
<td>Green and red off</td>
<td>DC mode</td>
<td>Battery operation (emergency mode)</td>
</tr>
</tbody>
</table>

6.3 Testing

DALI Control

A DALI command from a suitable control unit can be used to initiate function and duration tests at individually selected times. Status flags are set for report back and data logging of results.

When a DALI bus has not been connected or when a DALI bus is connected but the DALI default DELAY and INTERVAL times have not been re-set by sending appropriate DALI commands, then the EM converterLED PRO will conduct self-tests in accordance with the default times set within the EEPROM.

These default times are factory pre-set, in accordance with the DALI standard EN 62386-202, to conduct an automatic function test every 7 days and a duration test every 52 weeks. Since the DELAY time is factory pre-set to Zero, all units are tested at the same time. Test times can be changed with a command over the DALI bus.

The DELAY and INTERVAL time values must be re-set when the emergency system test times are to be scheduled by a DALI control and monitoring system.

Note that once the default values have been set to Zero, tests will only be conducted following a command from the control system. If the DALI bus is disconnected the EM converterLED PRO does not revert to self-testing mode.

Addressing

The EM converterLED PRO includes the EZ easy addressing system which allows addressing and identification by using the bi-colour LED in conjunction with the EM PRO addressing tool. Binary address codes given by the LED can be simply converted to the DALI addresses 0 to 63. For single handed addressing using this method it is necessary to send a broadcast identity command every 3 to 9 seconds. During this command the LEDs will be switched off and the indication LED will flash the 6 bit binary address preceded by a 3 second start indication period.
Commissioning
After installation of the luminaire and initial connection of the mains and battery supply to the EM converterLED PRO the device starts with the 20 hours initial charge followed by a 4 hours trickle charge for NiCd/NiMH batteries or with a 24 hours initial charge for LiFePO4 batteries. Afterwards the device conducts a commissioning test for the full duration. The 20 hours recharge for NiCd/NiMH batteries or 24 hours recharge for LiFePO4 batteries occurs also with the connection of a new battery. The following automatic commissioning duration test only takes place when a battery is replaced and fully charged and the interval time is not set to zero. In case the interval time is set to zero the device expects the DALI system to request the testing.

Functional test
The time of day and frequency of the 5 seconds function test can be set by the DALI controller. The default setting is a 5 seconds test on a weekly basis.

Duration test
The time of day and frequency of the duration test can be set by the DALI controller. The default setting is a duration test conducted every 52 weeks.

For 2h operation:
The first commissioning duration test has a time of 120 minutes, subsequent through life tests are conducted for 90 minutes. When the battery is changed or disconnected and re-connected the unit will next conduct a 120 minute test.

Prolong time
Prolong time can be set by the DALI controller. This is the delay time between return of the mains supply and the end of the emergency operation. The default prolong time is set as 0 minutes as specified within the DALI standard.
Indicator LED will stay off for the duration of the prolong time.

Rest Mode / Inhibit Mode
Emergency operation is automatically started when the mains supply is switched off. If the Rest Mode is activated, the discharging of the battery will be minimized by switching off the LED output. If the Inhibit Mode has been activated before the mains supply is switched off, Rest Mode will be automatically switched on if the mains supply is switched off within 15 minutes. Rest Mode and Inhibit Mode can be initiated by the DALI controller. The REST command has to be sent after the mains supply has been disconnected and whilst the EM converterLED PRO is in emergency operation. The INHIBIT command has to be sent whilst the EM converterLED PRO is supplied by mains.

After a mains reset the EM converterLED PRO exits the Rest Mode. Rest Mode and Inhibit Mode can both be disabled by sending the RE-LIGHT/RESET INHIBIT command.

Test switch
An optional test switch can be wired to each EM converterLED. This can be used to:
• Initiate a 5 seconds function test: press 200 ms < T < 1 s
• Execute function test as long as switch pressed: press > 1 s
• Reset selftest timer (adjust local timing): press > 10 s

Timer reset functionality
The timer for function and duration test can be set to a particular time of the day by either pressing the test switch for longer than 10 seconds or cycling the unswitched line supply 5 times within 1 minute. The timer adjustment will enable the test start time to be defined manually at time in day when the timer was reset. It will also disable the adaptive test algorithm thereby forcing the unit to perform the test at the same time rather than it being defined by the adaptive algorithm. This function will only work provided the interval time is greater than zero (automatic test mode enabled). The delay timer value set when the unit was commissioned will be reloaded in order to randomise the tests between adjacent units.

BlackBox data recording
Parameters providing information about the application and use are stored in the EM converterLED PRO. The parameters stored provide information on the mains, battery, LED output and emergency operation. The BlackBox can be read out with the masterCONFIGURATOR and deviceANALYSER.

DALI Controller
DALI controllers and hardware/software solutions are available from Tridonic. Please refer to the Lighting controls section.
### 7. Battery data

#### 7.1 Battery selection

<table>
<thead>
<tr>
<th>Technology and capacity</th>
<th>Design</th>
<th>Number of cells</th>
<th>Type</th>
<th>Article no.</th>
<th>Assignable batteries</th>
</tr>
</thead>
<tbody>
<tr>
<td>NiCd 4 Ah D cells</td>
<td>stick</td>
<td>1 x 2</td>
<td>Accu-NiCd 2A 55</td>
<td>89800092</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>stick</td>
<td>1 x 3</td>
<td>Accu-NiCd 3A 55</td>
<td>28002773</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>stick</td>
<td>1 x 4</td>
<td>Accu-NiCd 4A 55</td>
<td>89800089</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>side by side</td>
<td>3 x 1</td>
<td>Accu-NiCd 3B 55</td>
<td>89800384</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>side by side</td>
<td>4 x 1</td>
<td>Accu-NiCd 4B 55</td>
<td>89800385</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>stick + stick</td>
<td>2 x 2</td>
<td>Accu-NiCd 4C 55</td>
<td>28002775</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>remote box</td>
<td>1 x 3</td>
<td>Pack-NiCd 3D CON</td>
<td>89800389</td>
<td>•</td>
</tr>
<tr>
<td></td>
<td>remote box</td>
<td>1 x 4</td>
<td>Pack-NiCd 4D CON</td>
<td>89800390</td>
<td>•</td>
</tr>
<tr>
<td>NiMh 2.2 Ah Cs cells</td>
<td>stick</td>
<td>1 x 2</td>
<td>Accu-NiMh 2A</td>
<td>28002087</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>stick</td>
<td>1 x 3</td>
<td>Accu-NiMh 3A</td>
<td>28002088</td>
<td>•</td>
</tr>
<tr>
<td></td>
<td>stick</td>
<td>1 x 4</td>
<td>Accu-NiMh 4A</td>
<td>28002089</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>remote box</td>
<td>1 x 3</td>
<td>Pack-NiMh 2.2Ah 3 CON</td>
<td>28001898</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>remote box</td>
<td>1 x 4</td>
<td>Pack-NiMh 2.2Ah 4 CON</td>
<td>28001899</td>
<td>*</td>
</tr>
<tr>
<td>NiMh 4 Ah LA cells</td>
<td>stick</td>
<td>1 x 2</td>
<td>Accu-NiMh 4Ah 2A CON</td>
<td>28002316</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>stick</td>
<td>1 x 3</td>
<td>Accu-NiMh 4Ah 3A CON</td>
<td>89800441</td>
<td>•</td>
</tr>
<tr>
<td></td>
<td>stick</td>
<td>1 x 4</td>
<td>Accu-NiMh 4Ah 4A CON</td>
<td>89800442</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>stick + stick</td>
<td>2 x 2</td>
<td>Accu-NiMh 4Ah 4C CON</td>
<td>89800438</td>
<td>•</td>
</tr>
<tr>
<td></td>
<td>remote box</td>
<td>1 x 3</td>
<td>Pack-NiMh 4Ah 3 CON</td>
<td>28001896</td>
<td>•</td>
</tr>
<tr>
<td></td>
<td>remote box</td>
<td>1 x 4</td>
<td>Pack-NiMh 4Ah 4 CON</td>
<td>28001897</td>
<td>•</td>
</tr>
</tbody>
</table>

#### 7.2 Battery charge / discharge data

<table>
<thead>
<tr>
<th>Technology</th>
<th>Design</th>
<th>Number of cells</th>
<th>Type</th>
<th>Article no.</th>
<th>Assignable batteries</th>
</tr>
</thead>
<tbody>
<tr>
<td>NiCd 4 Ah D cells</td>
<td>stick</td>
<td>1 x 2</td>
<td>Accu-NiCd 2A 55</td>
<td>89800092</td>
<td>•</td>
</tr>
<tr>
<td>NiMh 2.2 Ah Cs cells</td>
<td>stick</td>
<td>1 x 2</td>
<td>Accu-NiMh 2A</td>
<td>28002087</td>
<td>•</td>
</tr>
<tr>
<td>NiMh 4 Ah LA cells</td>
<td>stick</td>
<td>1 x 2</td>
<td>Accu-NiMh 4Ah 2A CON</td>
<td>28002316</td>
<td>•</td>
</tr>
</tbody>
</table>

**Data sheet 07/22-EM100-16**

Subject to change without notice. Information provided without guarantee.

www.tridonic.com

---

**Note:** The battery will be charged below 0.9 V. The EM converterLED will indicate a battery fault.

The emergency lighting LED driver will recharge the battery normally after running the test of 63A47-2-7 CL 22.3 (abnormal operating conditions).
7.3 Accu-NiCd

4.2 / 4.5 Ah
International designation
Battery voltage/cell
Cell type
Case temperature range
to ensure 4 years design life
Max. short term battery case temperature
(Max shorter than 1 month over the battery lifetime)
Max. number discharge cycles
Max. storage time

7.4 Accu-NiMH

2.2 Ah
International designation
Battery voltage/cell
Cell type
Case temperature range
to ensure 4 years design life
Max. short term battery case temperature
(Max shorter than 1 month over the battery lifetime)
Max. number discharge cycles
Max. storage time

4.0 Ah
International designation
Battery voltage/cell
Cell type
Case temperature range
to ensure 4 years design life
Max. short term battery case temperature
(Max shorter than 1 month over the battery lifetime)
Max. number discharge cycles
Max. storage time

7.5 Accupack-NiCd

4.5 Ah
Battery voltage/cell
Cell type
Ambient temperature range
to ensure 4 years design life
Max. short term battery case temperature
(Max shorter than 1 month over the battery lifetime)
Max. number discharge cycles
Max. storage time

7.6 Accupack-NiMH

2.2 Ah
Battery voltage/cell
Cell type
Ambient temperature range
to ensure 4 years design life
Max. short term battery case temperature
(Max shorter than 1 month over the battery lifetime)
Max. number discharge cycles
Max. storage time

4.0 Ah
Battery voltage/cell
Cell type
Ambient temperature range
to ensure 4 years design life
Max. short term battery case temperature
(Max shorter than 1 month over the battery lifetime)
Max. number discharge cycles
Max. storage time

For a higher battery temperature rating for NiMH 4 Ah refer to the
EM converterLED xx MH/LiFePO4 product range.

7.7 Wiring batteries
To inhibit inverter operation disconnect the batteries by removing the connection at battery side.
For further informations refer to corresponding battery datasheet.

7.8 Storage, installation and commissioning
Relevant information about storage conditions, installation and commissioning are provided in the battery datasheets.

8. Miscellaneous

8.1 Maximum number of switching cycles
EM converterLEDs are tested with 50,000 mains switching cycles of the associated LED driver.

8.2 Battery replacement
After a battery replacement and a subsequent full charge cycle (24 h) a duration test is mandatory to prove that with the new battery the rated duration is achieved.

8.3 Mains-connected transformers
The EM converterLED does not contain mains-connected windings of transformers.

8.4 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.