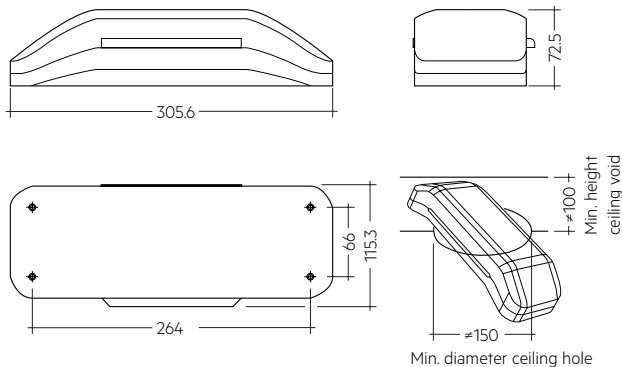
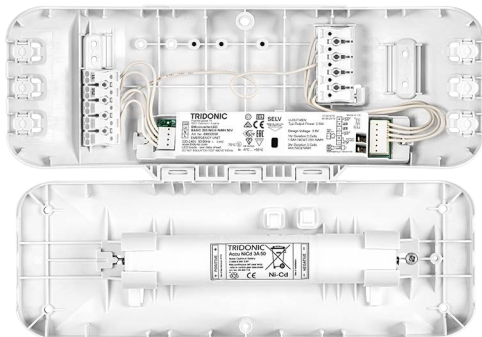


Non-maintained emergency lighting LED driver kit with automatic test function for LED modules
 with a forward voltage of 10 to 54 V
 3 h rated duration
 DALI certified emergency driver

EM converterPACK PRO Installation and wiring instructions



Description

EM converterPACK PRO is designed for use with emergency luminaires in conjunction with LED modules and LED drivers from Tridonic and other manufacturers. It is compatible with LED light modules for linear/area as well as downlight applications and can be used with fixed output or dimming LED drivers of up to 150 W power. The incorporated EM converterLED is approved to IEC / EN 61347-2-7 and provides a battery charge current that is within the range of charge currents quoted on the Battery Manufacturers Declaration Form for the ended battery types. This compatibility allows converted luminaires to comply with the relevant parts of IEC / EN 60598-2-22. Please note that due to EU law, this article is available for purchasing only outside of the European Union.

Warranty

- 5 years excluding batteries
- Batteries: 2 years NiCd, 5 years LiFePO₄

Technical data EM converterLED PRO

Rated supply voltage	220 – 240 V
AC voltage range	198 – 264 V
Mains frequency	50 / 60 Hz
LED module forward voltage range	10 – 54 V
Output current	see respective EM converterLED data sheet
Starting time	< 0.5 s from detection of emergency event
Overvoltage protection	320 V (for 48 h)
U-OUT (including open- / short-circuit and double load)	60 V
Max. open circuit voltage	60 V
Rated duration	3 h
Number of cells	3
Ambient temperature range t_a	+5 ... +45 °C
Max. casing temperature t_c (of EM converterLED inside)	80 °C
Mains voltage changeover threshold	according to EN 60598-2-22
Mains surge capability (between L – N)	1 kV
Mains surge capability (between L/N – PE)	2 kV
Type of protection	IP20
Rest mode max. number of emergency units	100
Rest mode max. wiring distance	1,000 m
Functional test	Weekly 5s test
Duration test	Yearly 3 h test
Life-time	up to 100,000 h
Dimensions LxWxH	305.6 x 115.3 x 72.5 mm

Battery charging time depending on battery type (NiCd or LiFePO₄).

Further information can be found in the respective datasheets on www.tridonic.com.

Ordering data

Type	Article number	Packaging carton	Packaging Pallet	Weight per pc.
EM converterPACK PRO 233 NiCd 50V	89801048	1 pc(s).	126 pc(s).	0.81 kg
EM converterPACK PRO 232A LiFePO ₄ 50V	89801049	1 pc(s).	126 pc(s).	0.57 kg

Status indication LED (not included)

Type	Article number	Packaging, bag	Packaging, carton	Weight per pc.
LED EM bi-colour, 1.0 m CON	89800273	25 pc(s).	200 pc(s).	0.015 kg
LED EM bi-colour, high brightness HO 1.0 m CON	89800275	25 pc(s).	200 pc(s).	0.015 kg
LED EM bi-colour, 0.6 m CON	89800474	25 pc(s).	200 pc(s).	0.005 kg
LED EM bi-colour, high brightness HO 0.6 m CON	89800475	25 pc(s).	200 pc(s).	0.005 kg
LED EM bi-colour, 0.3 m CON	89800274	25 pc(s).	200 pc(s).	0.005 kg
LED EM bi-colour, high brightness HO 0.3 m CON	89800276	25 pc(s).	200 pc(s).	0.005 kg

Test switch (not included)

Type	Article number	Packaging, bag	Packaging, carton	Weight per pc.
Test switch EM 3	89899956	25 pc(s).	200 pc(s).	0.013 kg

ACD EM LED INDICATOR HOLDER (not included)

Type	Article number	Colour	Packaging, carton	Weight per pc.
ACD EM LED INDICATOR HOLDER	28002189	White	10 pc(s).	0.010 kg

Technical data Accu-NiCd 4.5 Ah

International designation	KRMU 33/62
Battery voltage/cell	1.2 V
Cell type	D
Case temperature range to ensure	
to ensure 4 years design life	+5 °C to +55 °C
Max. short term battery case temperature (shorter than 1 month over the battery lifetime)	70 °C
Max. number discharge cycles	12 cycles per year plus 4 cycles during commissioning
Max. storage time	12 months

Technical data Accu-LiFePO4 1.5 Ah

International designation	IFpR 19/66
Battery voltage/cell	3.2 V
Cell type	18650
Case temperature range to ensure	
4 years design life	+5 °C to +55 °C
6 years design life	+5 °C to +45 °C
8 years design life	+5 °C to +35 °C
Max. short term battery case temperature (shorter than 1 month over the battery lifetime)	70 °C
Max. number discharge cycles	50 cycles total
Max. storage time	12 months at +5 °C to +25 °C

Components matrix

Type	Article number	EM converterLED		Battery	
		Type	Article number	Type	Article number
EM converterPACK PRO 233 NiCd 50V	89801048	EM converterLED PRO 203 NiCd/NiMH 50V	89800650	Accu-NiCd 3A 55	28002773
EM converterPACK PRO 232A LiFePO4 50V	89801049	EM converterLED PRO 202A MH/LiFePO4 50V	89800902	ACCU-LiFePO4 4.5Ah 3A CON	28002320

Further information can be found in the respective datasheets on www.tridonic.com.

Important

These instructions contain important safety information, read and follow them carefully. Tridonic will not accept any responsibility for injury, damage or loss, which may arise as a result of incorrect installation, operation, maintenance or disposal.

Isolate switched and unswitched mains and negative battery supply before installing or maintaining.

Insulation testing with 500 V DC is only allowed between the line and neutral connected together and the earth.

Note to the installer:

Please ensure this leaflet is made available to the user and/or maintenance engineer together with a test record card.

Conversion

1. It is recommended to carry out the conversion of a luminaire in accordance with ICEL 1004.
2. Ensure that the module and associated battery operate within their temperature ratings.
3. After conversion of a luminaire existing components must continue to operate below their temperature rating.
4. Wire the module and battery into the luminaire according to the wiring diagram.
5. Clearly identify the new unswitched supply to the converted luminaire.
6. Check operation of the LED charge indicator by connecting the unswitched line.
7. Check operation of the LED in the emergency mode by disconnecting the unswitched supply after 15 minutes.
8. Relabel the luminaire to identify the company responsible for the conversion.
9. Fill in test record card if the luminaire is being converted on site.
10. Mark the date of commissioning on the battery label.

Failure to do as mentioned above will invalidate any warranty claims.

LED driver compatibility

The EM converterPACK emergency unit use 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 of the associated LED driver applied to the EM converterLED output is 450V (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.

Maximum lead length

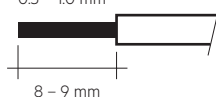
LED	1 m
Status indication LED	1 m
Test switch	1 m

Wiring type and cross section

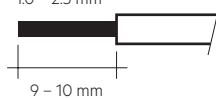
Strip from the cables to ensure perfect operation of terminals.

Wire type	Cross section	Strip length at cross section ≤ 1 mm ²	Strip length at cross section > 1 mm ²
Solid	0.5 – 1.0 mm ²	8 – 9 mm	9 – 10 mm
Stranded	0.75 – 2.5 mm ²	8 – 9 mm	9 – 10 mm

wire preparation:
0.5 – 1.0 mm²



wire preparation
1.0 – 2.5 mm²

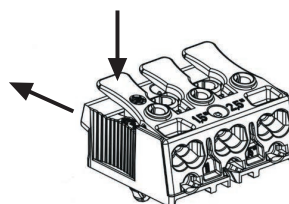


Use one wire for each terminal connector only.
Use each strain relief channel for one cable only



max. Ø = 10 mm
min. Ø = 6,3 mm

Loosen wiring



Wiring guidelines

- EM converterLED PRO:
The LED terminals, battery and indicator LED terminals are classified as SELV (output voltage < 60 V DC). Keep the wiring of the input terminals separated from the wiring of the SELV equivalent terminals or consider special wiring (double insulation, 6 mm creepage and clearance) when these connections should be kept SELV.
- 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 50Hz 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.

For maintained operation in conjunction with a LED driver: Do not exceed the length of LED leads. Note the length of the EM converterPACK leads to the LED module adds to the length of the leads from the LED driver to the EM converterPACK when considering the lead length of the LED driver.

General notes

Safety

This module and associated luminaire has both an unswitched mains electricity supply and a switched supply as well as an internal battery. To ensure safety disconnect all three before installation or maintenance work begins. (Isolate battery by disconnecting the negative lead.)

The batteries used together with this module contain an electrolyte which can be harmful to eyes and poisonous on open wounds. Take care when handling the batteries, to avoid puncturing the case. If electrolyte comes into contact with skin wash immediately in water.

Do not subject batteries to excessive charge or discharge currents. When working with batteries take care not to short circuit them with tools or jewellery etc.

Installation

Installation must be carried out by a competent person, in accordance with the national or local wiring regulations and BS 5266 Part 1; Code of Practice for Emergency Lighting. If in any doubt consult a qualified electrician.

Ensure that voltage and frequency requirements are compatible with the available supply.

Observe the correct polarity when making electrical connections.

Maintenance

The EM converterPACK contains a battery and EM converterLED which can be exchanged.

The EM converterLED does not contain serviceable parts and should not be opened. Doing so will invalidate the warranty.

Disposal of batteries

Do not incinerate batteries. Whilst disposing of small quantities is possible with little or no risk, large numbers require expert handling. Consult the relevant Local Authority Health and Safety Officers.

User obligation

Every care is taken by Tridonic, in the design and construction of its products, to ensure that as far as is reasonably practical, the products, when properly used are safe, and without risk to health.

The health and safety at work act, however, imposes upon the users of a Company's products, an obligation to ensure that all personnel involved with the installation, handling, use or disposal of the products are acquainted with the information provided by the Company, and are made fully aware of any precautions that need to be taken.

Modification

Do not attempt to modify this product. Any modification will invalidate the safety/approval marks, and may render the product unsafe. Tridonic will not accept responsibility for any modified product, or any injury damage, or loss, which may arise as a result of unauthorised modification.

Change of specification

Tridonic reserve the right to change specifications without prior notification or public announcement.

Housing properties

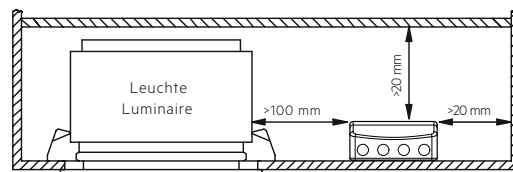
- Casing manufactured from polycarbonate
- Type of protection IP20
- Max. torque for the mounting screws: 0.8 Nm

Glow-wire test

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

Fixing conditions

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



Additional information

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

Guarantee conditions at www.tridonic.com → Services

Life-time declarations are informative and represent no warranty claim. No warranty if device was opened.

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.

Note: If the battery is connected the DALI communication is only possible after power reset.

Addressing

The EM converterLED PRO includes the EZ easy addressing system which allows addressing and identification by using the bi-colour LED. 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 ident 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 supply and battery supply to the EM converterLED PRO the unit will commence charging the batteries for 20 hours (initial charge). Afterwards the module will conduct a commissioning test for the full duration. The 20 hours recharge occurs also if a new battery is connected or the module exits the rest mode condition. The following automatic commissioning duration test is only performed when a battery is replaced and fully charged (after 20 hrs) and the interval time is not set to zero, otherwise the system is expected to perform 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 2 h 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.

Test switch

An optional test switch can be wired to each EM converterLED. This can be used to 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

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 while 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.

Rest Mode / Inhibit Mode are not supported from the EM converterLED in case of combination with a 1-cell battery.

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. The factory programmed delay offset (1 – 28 days) will be loaded after the reset into the delay timer for the function and duration test in order to randomize the tests between adjacent units.

DALI Controller

DALI controllers and hardware/software solutions are available from Tridonic. Please refer to the Lighting controls section.

Wiring – EM converterPACK PRO with a standard LED driver and one LED module for mains and emergency operation

