

MOUNTING AND INSTALLATION INSTRUCTIONS

EMCU/EM BOX Emergency Lighting Inverter for LED Conversions

Important note: These mounting and installation instructions must be read carefully and kept in a safe place. By installing an emergency lighting inverter (hereinafter referred to as device), the user implicitly accepts all recommendations in this manual.

1) Application and technical data

The devices of the EMCU and EM BOX series are intended for use in emergency lighting installations in accordance with EN 50172 and are certified to conform with EN 60598-2-22 and EN 61347-2-7. They must be operated with an LED driver and an LED array in an LED luminaire.

Operating conditions

Correct application requires fulfilment of the following conditions:

- The LED array can be supplied with DC current via two wires only. No other signals or voltages are required for the LED array.
- The two wires of the LED array must be accessible.
- In the case of a constant voltage source, the rated power supplied by the LED driver in mains operation must be higher than the power supplied by the device in emergency operation.
- The maximum mains current when switched on must not exceed 2.5A.

More detailed technical information can be found in the associated data sheets. These are available at www.lampec-swiss.ch or on request.

Technical data

Rated operating voltage range: U_n = 220...240 V
 Permissible mains frequencies: 50 / 60 Hz
 Non-maintained power consumption: max. 3.5 VA (1h emergency operation)
 max. 4 VA (3h emergency operation)
 Min. ambient temperature: 5 °C
 Max. ambient temperature: 50 °C
 Protection class: IP20
 Certified to conform with: EN 61347-2-7, EN 60598-2-22
 Self-test conforming with: EN 62034
 Suitable for installations according to: EN 50172
 Steel housing: sendzimir galvanised
 Plastic housing: polycarbonate (glow wire test 850 °C)

2) Device type selection according to LED forward voltage

- When selecting a suitable device type, both the LED forward voltage and the luminaire design must be taken into account. The forward voltage is read from the LED driver.
- For SELV luminaires with touchable LEDs (luminaire cover can be removed without special tools), the 55V device type must be used.
- For SELV luminaires requiring special tools to open the housing, the 105V device type can be selected if the maximum forward voltage is within the corresponding range.
- For non-SELV luminaires, the device type whose forward voltage range comes closest to the output voltage of the LED driver must be selected. Example: 220V type for forward voltage 150V.
- The table below shows the forward voltage ranges of the various device types and the maximum output voltage in the faulty state of the LED array.

device type	voltage range U	U max.
55V	U 12...55 VDC	60 V
105V	U 20...105 VDC	120 V
220V	U 100...220 VDC	300 V (EMCU T: 350V)

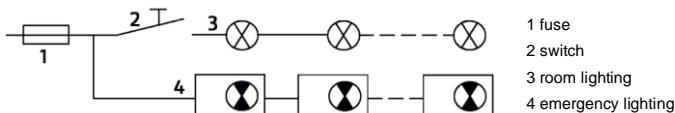
3) Mounting

- Device to be mounted in a suitable position in the luminaire (hole Ø 4 mm opposite fixing holes).
- Cables to be kept as short as possible to meet EMC requirements.
- Battery, LED and status indicator LED cables should be kept separate from mains cables.
- Battery to be mounted in the coolest spot in the luminaire in order to achieve the longest possible battery life. Battery's ambient temperature must not exceed 50 °C.
- Device must not be mounted on surfaces that decompose, melt or otherwise change due to thermal effects at 60 °C.
- Device is not suitable for use in potentially explosive atmospheres unless appropriate preventive measures are taken on the part of the luminaire.
- When mounting outside the luminaire, device and battery must be mounted in an additional housing with strain relief. Cable length between device and LED array max. 1 m.)

3) Electrical wiring

Electrical wiring must be carried out by qualified personnel only. Operating voltage exceeds 50 V, life hazard! Make sure that the device's rated operating voltage equals that of the luminaire and that the protective conductor is connected in the case of protection class I types. Terminals are designed for 0.5 to 1.5 mm² wires, stripped insulation 7.0...7.5 mm.

The device must be powered from a non-switched phase at L to ensure mains monitoring and permanent battery charging. Optionally, an additional (switched) phase may be connected to L' in order to switch the lamps on and off accordingly or to operate them in maintained mode.



4) Tests

After installation, the emergency luminaire is tested according to EN 60598-1. Battery and mains supply must be disconnected from the device for at least 6 seconds after the last test step in order to put the device into initial commissioning mode and to prevent a complete discharge of the battery. The battery may then be reconnected.

5) Installation and inspection of the emergency luminaire

Installation and operation are subject to the regulations and standards for emergency luminaires on site. All covers must be in place before the emergency luminaire is put into operation. The emergency luminaire must be supplied from a non-switched phase to L for mains monitoring and permanent battery charging. This phase must be connected to the same group fuse as the regular room lighting. Optionally, an additional (switched) phase may be connected to L' in order to operate the luminaire in switchable maintained mode. The device's indicator LED shows the operating status according to the optionally enclosed fault indication label (see section 8). If the status indicator LED remains off for more than 10 minutes, the emergency luminaire is not ready for use. After installation, the system must be checked in accordance with EN 62034.

6) Battery regeneration

The battery is automatically regenerated immediately after initial start-up and after each battery change or after rectification of a charging error to optimise capacity. Three cycles are repeated, consisting of a 24-hour battery charge followed by a full discharge. The battery is discharged via emergency operation.

Important: Any action that disturbs or impairs these processes in any way (e.g. interrupting mains power supply) will lead either to an extension of the battery regeneration time or to a fault message. **Note:** The battery regeneration procedure is not carried out after a normal discharge, even leading to deep discharge protection, nor after a battery test. During the regeneration procedure, the battery capacity is not checked. Device types for DALI monitoring do not perform battery regeneration.

7) Commissioning and testing

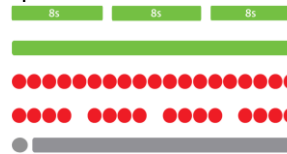
All device types will charge the battery for 24 hours after completion of the battery re-generation (see section 6). After commissioning, the device must be checked according to EN 62034.

Note: Device types for remote bus monitoring (ATS according to PER or PERC) block manual triggering of a test as long as regeneration or recharging of the battery continues.

8) Devices [EL-T] with automatic self-test (S versions)

Self-testing automatically checks the operational readiness of device, lamp and battery approx. every 8 days (randomly 8 to 8.25 days after commissioning). The first and every twelfth subsequent test after commissioning also measures the battery capacity by simulating a mains failure. Self-testing devices require visual inspection of the optical status indicator LED and the connected luminaire in accordance with standards and regulations on site.

Optical status indicator LED



Status LED intermittently green: battery regeneration (see section 6)

Status LED permanently green: no malfunction / normal condition

Status LED flashes red: Battery cannot be charged or the battery voltage is above the threshold value for a charging failure. The display changes to green immediately after the fault is rectified.

Status LED flashes intermittently red: LED array not connected / defective.

Status LED off: Device in emergency operation; as long as the battery is completely discharged, the status indicator LED remains off. If mains power is available, the indicator LED must light up green after max. 10 minutes, otherwise there is no mains voltage, or battery or device are defective.

9) Devices for bus monitoring (ATS according to PER or PERC)

Meter-Bus (xBS versions): Bus addresses 1 to 126 must be programmed prior to installation. The corresponding instructions are available upon request.

DALI (xDS versions): Short addresses 0 to 63 are assigned automatically during commissioning.

10) Devices [EL] without self-test

Devices without self-test require a periodic manual check of the lamp and the battery in accordance with standards and regulations on site. The optical status indicator LED corresponds to that of self-testing devices with the exception that states are only displayed in green.

11) Maintenance / Battery replacement

For maintenance and inspection, the emergency lighting standards and regulations on site must be observed. Maintenance work may only be carried out by trained personnel. The battery must be replaced as soon as the specified rated operating time is no longer reached during a test; in the case of self-testing devices, this is indicated by the status indicator LED (see section 8). To change the battery, the following steps must be carried out in the following sequence.

- Device types for remote bus monitoring (ATS systems according to PER and PERC) should have emergency operation disabled for the luminaire to be serviced.
- Fully disconnect the luminaire from the power supply. **Caution!** The luminaire can deliver life-threatening voltages to the LED array if emergency operation has not been disabled.
- Remove cover(s) according to separate instructions provided by the luminaire manufacturer.
- Disconnect the battery from the device and remove it from the holder or mount.
- Insert a new battery of the same type, fix it in place and connect it to the device. Only batteries of the same type provided by the manufacturer may be used. It is essential to ensure correct polarity in order to avoid damage to the battery and the device. The device's battery leads are marked as follows:

red = ⊕ (positive) black = ⊖ (negative)

- Attach and fasten all covers according to the luminaire manufacturer's instructions.
- The luminaire can now be supplied with mains voltage again. Re-enable emergency operation. In the case of remote monitoring, manual triggering of a test is blocked as long as battery regeneration or charging is in progress.

The luminaire must be checked according to EN 62034 following maintenance.

12) Important notes / product liability

The requirements of the standard EN60598-1 regarding safety must be met after installation of the device in the luminaire. The responsibility for compliance with this standard lies with the user of the device. In the event of non-compliance with this standard or incorrect selection of the device types, the manufacturer declines all liability.

The manufacturer accepts no liability for direct, indirect or incidental damage that does not arise from the proper use expressly approved by the manufacturer. Nor shall the manufacturer be liable for any claims by third parties not arising from the proper use expressly authorised by the manufacturer. The devices must not be opened or modified in any way. The emergency luminaires' components may only be replaced with original spare parts.

Important: When using the devices in conjunction with LED arrays, ESD protection must be ensured. The manufacturer accepts no liability for electrostatic damage.

The warranty for rechargeable batteries is only guaranteed if original rechargeable batteries are used. This also applies to self-testing devices. If the device shows signs of damage which indicate that safe operation is not possible, the luminaires or devices must not be put into operation. The manufacturer reserves the right to change figures, weights, dimension tables or other such information in the data sheet or in the operating instructions without prior notice if this proves to be expedient or is due to technical progress.

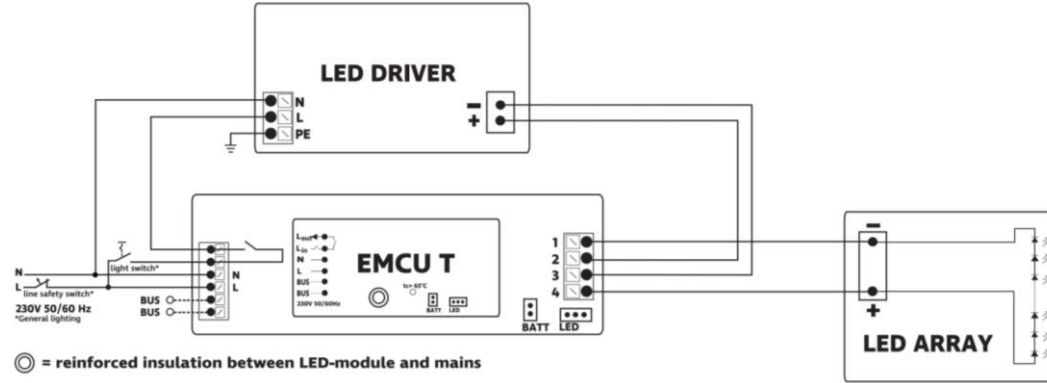
13) Disposal

The user is obliged to properly separate, collect, store, transport and recycle the supplied packaging material, any unused accessories and the device together with the connected components (in particular the battery) at the end of its useful life in accordance with the EU Directive 2012/19/EU on waste electrical and electronic equipment (WEEE).

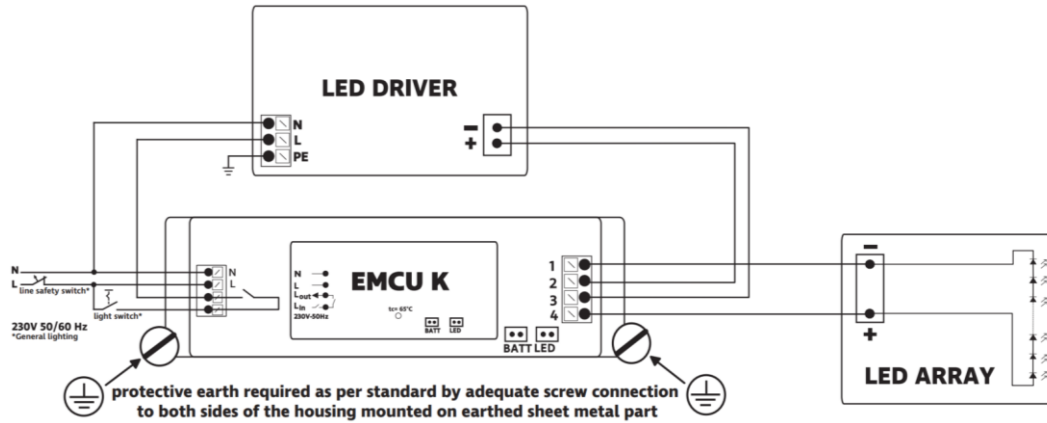


Wiring diagrams

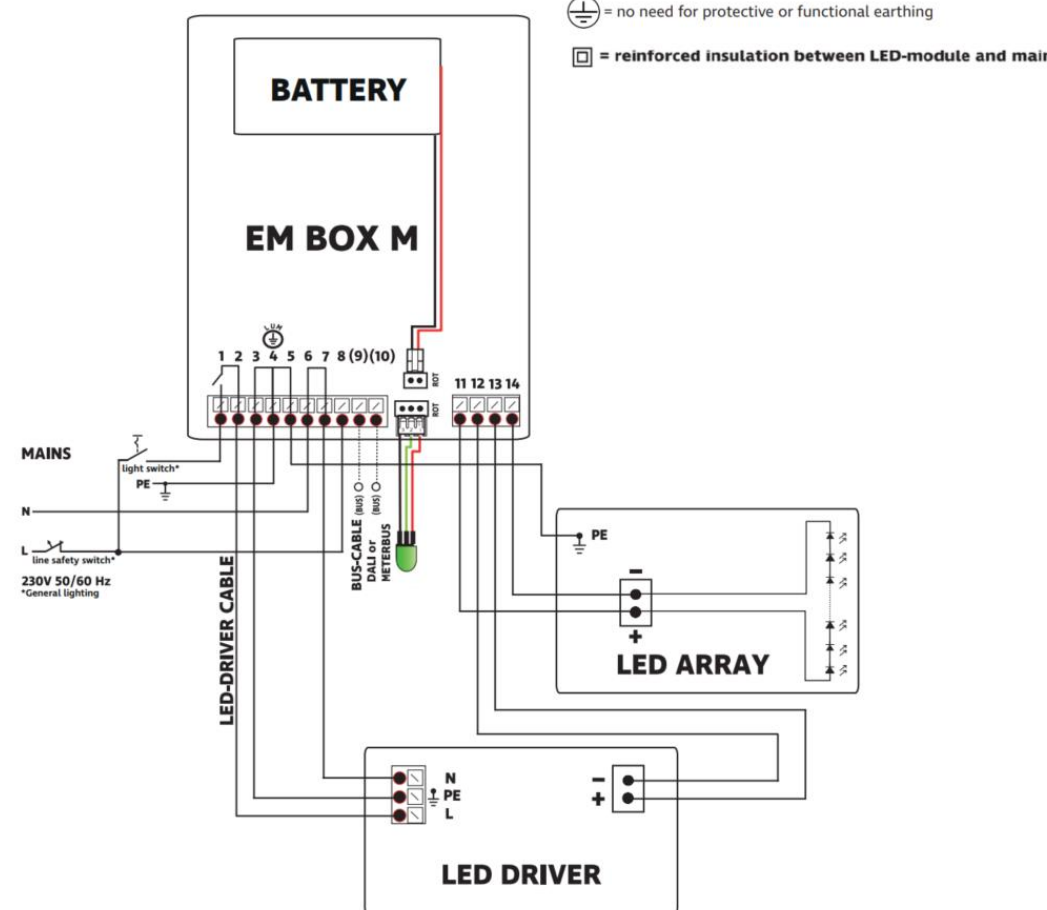
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