

EMERGENCY LIGHTING

ELCEM81-IOT(BM)



Features

- Communication type: BM (Bluetooth mesh)
- Complete set with integrated electronics, LED module, housing, battery and a ELC-IOT/BM module.
- The LED emergency module ELCEM81-IOT(BM) can be integrated into the Silvair ecosystem for use and supporting EnOcean switches.
- For LED module with a forward voltage of 5.5-6.5Vdc
- ELCEM81 is SELV output voltage
- Plug-in Lithium Iron Phosphate battery
- Constant power output, output current self-adjustable
- Automatic shutdown of output if LED load is out of range
- 5 years guarantee electronic

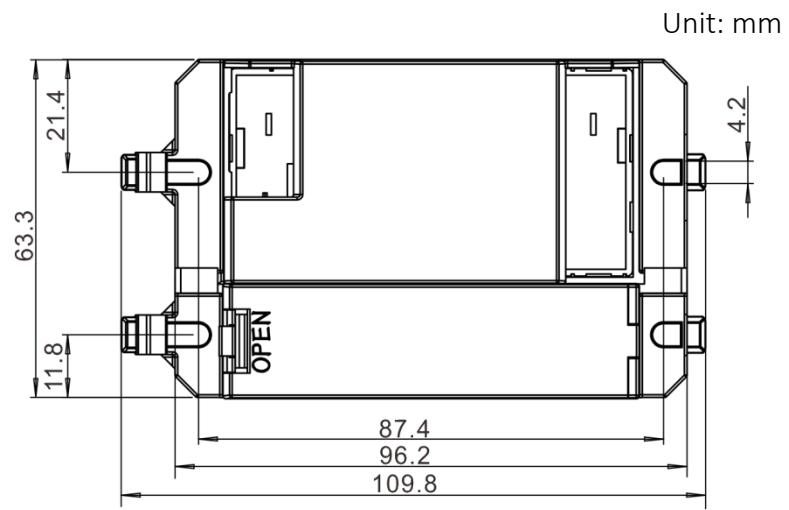
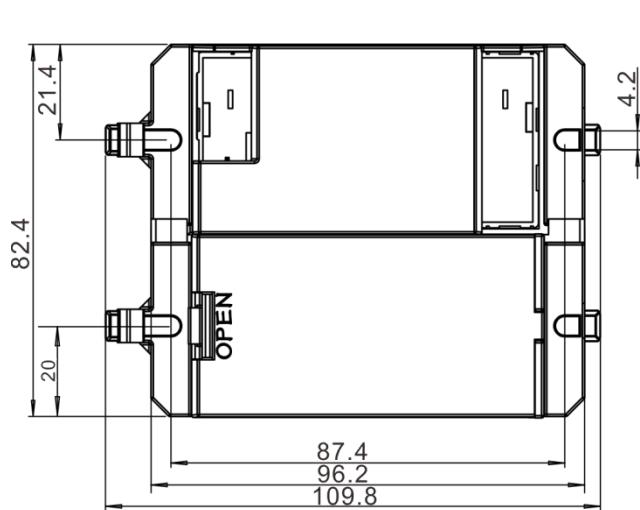
Functions

- Maintained/Non-maintained operation
- Self-test function and Bluetooth/Silvair Function
- Electronic charge system
- Deep discharge protection
- Short-circuit-proof battery connection
- Open-circuit-proof
- Polarity reversal protection for battery



Technology Partner
EL-T **SILVAIR**

Dimensions



Unit: mm

Item Code	Carton size	QTY	Weight per pc.	Battery
81-1.2W-1/3H 81-2.5W-1H Single battery compartment series	380*250*170	32PCS	120g	18650 1 cell
81-2.5W-3H Side-by-side battery compartment series	380*250*170	32PCS	168g	18650 2 cells

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Technical Data

Rated supply voltage	220-240VAC
AC voltage range	144-187VAC
Mains frequency	50/60Hz
Power factor	≥0.5
Starting time	1s
Output overvoltage protection	10V
U-OUT(including open-/short-circuit and double load) U-OUT	10V
Ambient temperature ta	5-55°C
Max. Casing temperature tc	75°C
IP rating	IP20
In-rush current	3A
In-rush current duration	3.5ms
Mains surge capability (between L – N)	1KV
Maximum withstand voltage	2KV+4U
Withstand time	60s
Frequency	2.360Ghz to 2.500Ghz
TX Power	+8dBm
Maximum current	31mA TX only @ +8dBm
RX Sensitivity	-103 dBm@BLE 125kbps, -95 dBm@BLE 1M

Item Code	Typical output emergency power	Mains input current, min	Mains input current, max	Input power in mains operation, min	Input power in mains operation, max
ELCEM81-IOT	1.2W	0mA	30mA	0W	3.5W
	2.5W				

Item Code	LED module forward voltage range Min-Typ-Max	LED module forward current range Min-Max	LED module forward power range Min-Max
ELCEM81-IOT-1.2W	5.5-6-6.5V	110-180mA	0.7-1W
ELCEM81-IOT-2.5W	5.5-6-6.5V	230-350mA	1.5-1.95W

Note:

- 1.All specifications are typical at 25°C unless otherwise stated.
- 2.All specifications are typical on the 230VAC unless otherwise stated.

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ELCEM80L/H-IOT

Testing

Introduction:

Technology Partner

SILVAIR

Emergency lighting devices automatically provide enough light if the power is cut, allowing all occupants of a building to evacuate safely in the event of a fire or other emergency. The Silvair Emergency Lighting Testing feature is designed for self-testing emergency lighting devices with a backup battery. The Silvair Emergency Lighting Testing is not designed for use for emergency lighting solutions with a central battery system. Regular testing of emergency lighting is often mandatory by law and a condition of building insurance. The building owner may be required to carry out testing and keep the test results for a specified period of time.

① Operation

The Silvair solution is based on emergency lighting testing (ELT) that is carried out automatically by each device according to a schedule defined by the user in the Silvair web app. Tests can also be started manually for a specific device using the Silvair mobile app for iOS/iPadOS.

The mobile app for iOS/iPadOS is used to collect the test results from all emergency devices in the project. The results are then sent to the cloud, can be viewed in the Silvair web app, and can be printed to a PDF file.

Two types of tests can be scheduled: functional and duration.

② Type of tests

Type	Interval	Description
Functional	Every 1–52 weeks	<p>Short test. It checks the integrity of the circuit and the correct operation of the luminaire, switching device, and backup battery.</p> <p>Carried out at the same time for all zones.</p>
Duration	Every 4–52 weeks	<p>Long test. It checks if the backup battery provides power for the required period of emergency operation.</p> <p>A duration test should be carried out separately for at least two groups of zones so that luminaires in adjacent zones are not tested at the same time.</p> <p>You can create up to four groups of zones and configure the test to start in each group separately at intervals of one week.</p>

③ Requirements

- For the Silvair Emergency Lighting Testing to work correctly, the following are necessary:
- The lighting project has been commissioned with the Silvair Commissioning tools.
- The project contains luminaires that support ELT.
- The project version is 202201 or later.
- All areas are within radio range and can communicate with each other.
- Silvair mobile app installed on an iOS/iPadOS mobile device.
- You or a collaborator with access to the project are on-site to collect the test results.

④ 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 APP. The REST command has to be sent after the mains supply has been disconnected and whilst the ELCEM81 is in emergency operation. The inhibit command has to be sent while the ELCEM81 is supplied by mains. After a mains reset the ELCEM81 exits the Rest Mode.

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ELCEM80L/H-IOT

Testing

LED Indication	Status	Description
Permanent Green	Standby ,System OK	Mains Operation ,battery is charged
Fast flashing Green (0.25s on 0.25s off)	Function test underway	Function test underway
Slow flashing Green (1s on 1s off)	Duration test underway	Duration test underway
Permanent Red	Lamp failure	Open Circuit or Short circuit or LED failure
Fast flashing Red (0.25s on 0.25s off)	Battery capacity failure	Battery failed duration test
Slow flashing Red (1s on 1s off)	Battery fault	Incorrect battery voltage or Short circuit or Open Circuit
Green and Red off	Battery Operation	Emergency mode:Mains disconnected or Mains failure
Slow flashing Red (1s on 3s off)	Battery temperature error	When power on and battery temperature is above 60(±2)°C or below 0(+2) °C
Green flashing (30ms on,270ms off)	Unallocated network	Bluetooth module not assigned to mesh network
Green flashing (125ms on,125ms off, 125ms on,125ms off, 1000ms on,1000ms off)	Inhibit mode	In inhibit mode
Green flashing (500ms on,500ms off)	Identify mode	In identify mode, instructions for searching devices on the APP
Green flashing (400ms on,100ms off)	Resetting in progress	Resetting in progress

Notice

Fault status:

If an error is detected , the indicator LED will switch to RED. If the error has been corrected please re-connecting the battery after the mains power off, the indicator LED immediately will switch back to GREEN when mains power on

Notice

Battery failed duration test:

After an exchange of the battery and holding down the button (>10S) reset the timer, the indicator LED will switch to GREEN.

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Mode Switching

ELCEM81-IOT(BM) can be used as both a self-test product and a Bluetooth communication product.

In self-test mode, it is an independent self-test product that can carry out initial, weekly, and annual tests without a Bluetooth module.

In Bluetooth communication mode, a Bluetooth module is required for carrying out initial, weekly, and annual tests.

After the initial power-on or reset of the timer, within 24 hours, if the Bluetooth module is not connected, the product will work in self-test mode; if the Bluetooth module is connected, it will work in Bluetooth communication mode. At the exactly 24th hour, the working mode will be locked.

Within 24 hours, if the Bluetooth module is not connected, the product will be locked at the 24th hour in self-test mode and only work as self-test product, even though the module is connected after, and it will only carry out the tests and report results according to self-test program.

Within 24 hours, if the Bluetooth module is connected, the product will be locked at the 24th hour in Bluetooth mode and only work as Bluetooth communication product, even though the module is disconnected after, and it will only carry out the tests and report results according to Bluetooth system setting. After the working mode is locked, the product can be reset by holding the test button for 10 seconds or powering on and off 3 times within 20s. At the 24th hour after reset, the operating mode will be locked again.

If the product is completely powered off (without AC or battery connected) within 24 hours after its initial power-on or reset, the 24-hour timer will be cleared when it is powered on again.

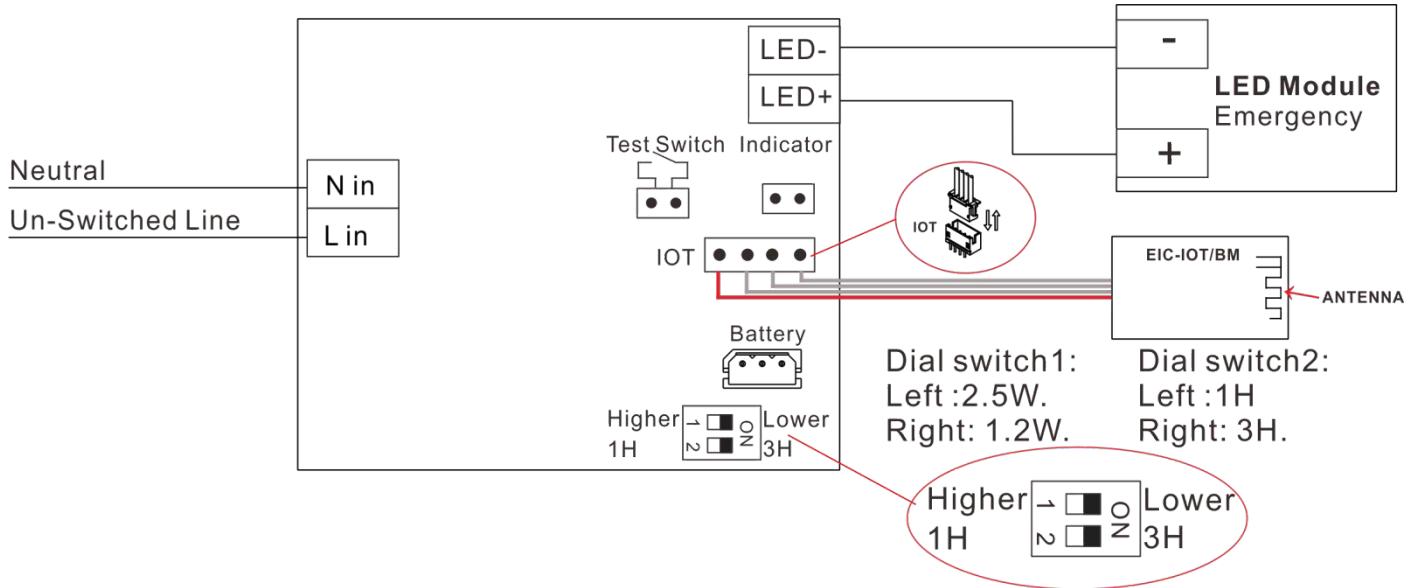
Timeline	Bluetooth module existence status	Product running status	
First power on/ start after reset	-	-	If running in self-test mode, please refer to the specification sheet of the self-test product for relevant operational details.
T<24H	exist	Bluetooth communication mode	
	not exist	Self-test mode	
T==24H	exist	Bluetooth communication mode (Not execute first-inspection)	
	not exist	Self-test mode (Execute first-inspection)	
T>24H	exist	According to the status at T==24	
	not exist		

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Wiring Diagram

U-OUT of the LED drive is 10V



Notice:

With the following cases, the indicator will be off:

1. Mains power off, the light goes into emergency mode.

Requirements for LED Control gear:

1. The load voltage range is 5.5-6.5V

Note:

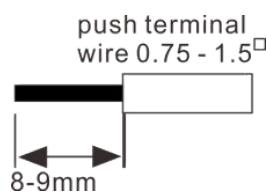
1. Please noted that functions switching by dial switch would only be available when all the wiring is disconnected, including the AC input, DC output and the battery.

2. Checking battery capacity before doing switch.

3. If the installation location of the module is covered with metal, it will affect the communication distance.

Requirements for wiring wires:

1. Wire diameter range: 0.5-1.5 square millimeters;



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Battery Data

Emergency power	Batteries	Emergency Duration	Battery discharge current Min-Typ-Max	Battery output power Min-Typ-Max	Battery fully charged time	Charge Current	Battery discharge voltage Min-Typ-Max			
ELCEM81-1.2W	18650/3.2V/1500mAhLiFePO4	1h	300-400mA	1-1.2-1.3W	24h	250-300mA	2.0-3.2-3.65V			
	18650/3.2V/1500mAhLiFePO4	3h								
ELCEM81-2.5W	18650/3.2V/1500mAhLiFePO4	1h	600-850mA	2.2-2.4-2.65W						
	18650/3.2V/3000mAhLiFePO4	3h								

Note:

Automatically charge when the voltage of a single battery drops below 3.4V. When the voltage of a single battery exceeds 3.65V, the charger turns off (0mA).

If the battery temperature is above 60 ($\pm 2^{\circ}\text{C}$) or below 0 ($+2^{\circ}\text{C}$), the battery will stop charging.

The emergency lighting LED driver will recharge the battery normally after running the test of 61347-2-7 CL22.3 (abnormal operating conditions).

When the voltage of a single battery is below min 2.0 V, the battery will not enter an emergency state.

The minimum charging environment temperature of the battery is 5°C, to ensure that the battery can be charged

Capacity	1.5/3.0Ah
International designation	IFpR 18/65
Battery voltage/cell	3.2V
Cell type	18650
Case temperature range to ensure	
4 years design life	+5°C to +55°C
5 years design life	+5°C to +45°C
6 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	6 months

Notice: Storage condition

Batteries should be stored within the specified temperature range in low humidity conditions.

Optimal storage conditions are

- Temperature:-20°C to +40°C

- Humidity: 45%- 85%

Avoid atmosphere with corrosive gas

It is recommended to disconnect the battery before storage or delivery

Battery should be charged every three months in order to keep it's initial performance.

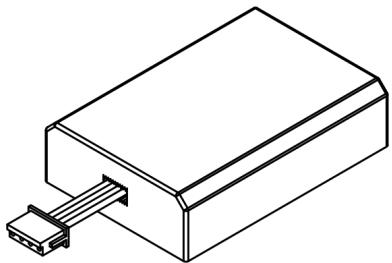
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Standard

This product meets the following standards:

- EN IEC61347-2-7
- EN 61000-3-2
- EN 55015
- ROHS 2.0
- EN IEC61347-1
- EN 61000-3-3
- EN 61547

Item Code	AC quick plug in connector	
Accessories' Images		<ul style="list-style-type: none"> • Wireless intelligence controller • Module size:43mm*30mm*11mm • Line length:210mm • Master chip:nrf52840 • 4P connector • Voltage: 3.3V • Frequency: 2.360Ghz to 2.500Ghz • TX Power: +8dBm • Maximum current: 31mA(TX only) @ +8dBm • RX Sensitivity:-103 dBm@BLE 125kbps,-95 dBm@BLE 1M



Status indication bi-colour LED

Two-colour status display LED
Green:system OK,Red:fault
Plug connection
Opening size:6*6mm
Line length:12cm/23cm/50cm/1m/2m



Test switch

For connection to the emergency lighting unit
For checking the device function
Plug connection
Dielectric strength:500V AC for 60 seconds
Opening size:7.5*7.5mm
Line length:12cm/23cm/50cm/1m/2m



Test switch

For connection to the emergency lighting unit
For checking the device function
Plug connection
Dielectric strength:1KV AC for 60 seconds
Opening size:7.5*7.5mm
Line length:12cm/23cm/50cm/1m/2m



Test switch

For connection to the emergency lighting unit
For checking the device function
Plug connection
Dielectric strength:500V AC for 60 seconds
Opening size:12*12mm
Line length:12cm/23cm/50cm/1m/2m



Integrated waterproof button indicator light

For connection to the emergency lighting unit
For checking the device function
Plug connection
Dielectric strength:1000V AC for 60 seconds
Two-colour status display LED
Green:system OK,Red:fault
Opening size:12*12mm
Line length:12cm/23cm/50cm/1m/2m



White indicator base

For fixation status indication bi-colour LED
Opening size:19*19mm

Battery extension cable

Cable length:
60mm/150mm/200mm/350mm
3-pole plug connection

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Service Life

Average life-time 50,000 hours under rated conditions with a failure rate of less than 10% for the emergency converter as rated power. Average failure rate of 0.2% per 1000 operating hours.

Important

The unit use dangerous mains voltage, it should be installed by qualified electricians only according to European safety standard or relevant nation regulations.

The emergency converter can only be used with the LED lamps and only suitable for use in indoors. Protect the electronics converter against excessive heat.

Connect the LED lamps to the emergency converter with correct polarity according to the schematic drawing.

The maximum length of the output cable to the LED lamps should not exceed 3m according to the EMC standard.

Connect the unit to AC power only after the wiring been completed between emergency converter and LED lamps.

About such situations, no ability can be taken over for possible damage: the emergency converter is used for purposes other than originally intended; connected in the wrong way.

Battery should be charged every three months in order to keep it's initial performance.

The emergency function test must be performed when a battery is fully charged for 24 hours.

The controlgear is not intended for use in luminaires for high-risk task area lighting.

The recharging device will recharge the battery ESSS normally after removal the short circuit link (S/C battery +/-) and reconnecting the ESSS.

The electric source for safety service is not a user serviceable item and shall only be replaced by the manufacturer service agent or a similar qualified person.

Insulation between battery circuits / indicator circuits / MT (ATS) circuits and normal supply fulfils reinforced insulation for all models.

Insulation between battery circuits / indicator circuits / MT (ATS) circuits and LED circuits fulfils reinforced insulation for "L"series.

If a LED driver is used with these control gears, The LED driver shall be in compliance with IEC/EN 61347-2-13 and shall provide double or reinforced insulation between input circuits and output circuits.

For built-in convertors: rely upon the luminaire enclosure for protection against electric shock.

Test switch and indicator can only be used internally.

The controlgear relies upon the luminaire enclosure for protection against accidental contact with live parts.

The circuit is protected after a battery short circuit, after the battery is restored, the charging circuit can charge normally.

The emergency converter is not proof against supply voltage polarity reversal.

The controlgear is suitable for use only on battery supply not having a trickle or intermittent re-charging circuits.