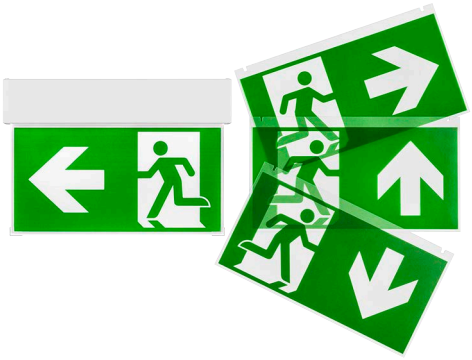
EM ready2apply PRO Exit 30m

EM ready2apply



Product description

- LED emergency exit sign suitable for various mounting options (ceiling, wall)
- Complete set with integrated electronics, pictograms (5 pcs. included) and battery
- DALI interface and automatic test function

Properties

- Viewing distance up to 30 m, single and double sided
- Non-maintained and maintained operation
- Very low stand-by power loss
- 3 h rated duration
- Two breakable entrance holes at the back and top
- Simple connection of Lithium Iron Phosphate battery with plug-in system
- Integrated status LED and test switch
- 5 years guarantee (conditions at www.tridonic.com) electronic (LED driver)
- 4 years guarantee battery

Standards, page 4

Wiring diagrams and installation examples, page 4

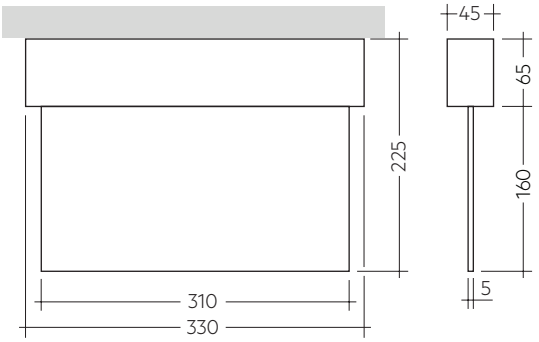
SELV EL-T RoHS

EM ready2apply PRO Exit 30m

EM ready2apply

Technical data

Rated supply voltage AC	220 – 240 V
Input voltage range AC (tolerance for safety)	198 – 264 V
Input voltage range AC (tolerance for performance)	198 – 254 V
Mains frequency	50 / 60 Hz
Overvoltage protection	320 V (for 48 h)
Time to light (emergency operation)	< 0.5 s from detection of emergency event
Output current tolerance	± 10 %
LF current ripple	± 5 %
Ambient temperature ta	+5 … +40 °C
Mains voltage changeover threshold	According to EN 60598-2-22
Type of protection	IP40
Impact protection rating	IK03
Protection class	II
Colour temperature	6,500 K
Colour tolerance	Mac Adams 3
Colour rendering index CRI	> 80
Lifetime	up to 50,000 h



Ordering data

Type[1]	Article number	Rated duration	Number of cells	Packaging, carton	Packaging, pallet	Weight per pc.
EM R2A PRO Exit 30m	**28004648**	3 h	2	1 pc(s).	198 pc(s).	1 kg

Specific technical data

Type	Rated duration	Number of LEDs	Typ. λ (at 230 V, 50 Hz)	Forward voltage range LED module[3][4]	Non-maintained operation		Maintained operation	
					Mains current in charging operation[2]	Mains power in charging operation[2]	Mains current in charging operation[2]	Mains power in charging operation[2]
EM R2A PRO Exit 30m	3h	1	0.55C	2.6 – 3.4 V	21/11 mA	2.1/0.9 W	31/23 mA	4.0/2.8 W

[1] EM = Emergency

[2] For LiFePO4 batteries voltage dependent constant current charging is used. The values displayed are for charging on / charging off.

[3] When exceeding the rated power of 1 respectively 2 W the LED current is reduced proportionally.

[4] Tolerance range for electrical data: ±10 %.

ACCES-SORIES

Lithium Iron Phosphate Battery pack 3.0 Ah

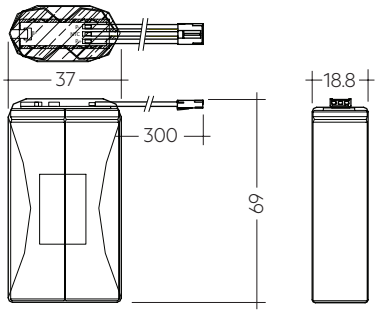
Batteries

Product description

- High temperature LiFePO4 cells for the use with EM ready2apply exit signs
- 6-year design life (up to 30°C ambient temperature)
- 4-year design life (up to 40°C ambient temperature)
- 4 years guarantee

Properties

- Certified quality manufacturer
- Charge efficiency > 90 %
- Low self discharge
- Simple connection with plug-in system
- Protection and monitoring circuit built into battery sleeve
- Deep discharge protection
- Suitable for emergency lighting equipment as per IEC 60598-2-22



Ordering data

Type	Article number	Packaging, carton	Weight per pc.
ACCU-LiFePO4 3.0Ah 2B CON	**28002319**	1 pc(s).	0.1 kg

1. Standards

according to EN 50172
EN 55015
EN 60068-2-6
according to EN 60068-2-30
EN 60598-1
EN 60598-2-2
EN 60598-2-22
EN 61000-3-2
EN 61000-3-3
EN 61347-1
EN 61347-2-7
EN 61347-2-7/A1
EN 61347-2-13
EN 61347-2-13/A1
EN 61547
according to EN 62034
EN 62384
EN 62386-101
EN 62386-102
EN 62386-202
IEC 62133 (related to Lithium Iron battery)
UN 38.3 (related to Lithium Iron battery)
EN 62031
EN 62471
ISO 3864-1
ISO 7010

1.1 Glow-wire test

according to EN 60598-1 with increased temperature of 850 °C passed.

2. Thermal data

2.1 Temperature range

According to the standard IEC 60598-1 a LED driver for remote installation has a max. case temperature of 90 °C. The ambient temperature range ta for the EM R2A PRO is defined to meet this requirement.

2.2 Expected 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

Type	ta	25 °C	35 °C	40 °C
EM R2A PRO	lifetime	> 100,000 h	> 50,000 h	50,000 h

2.3 Storage conditions

- Humidity 5 % up to max. 85 %, not condensed (max. 56 days/year at 85 %)

Note: The devices have to be within the specified temperature range (ta) before they are operated.

- Store batteries within the specified temperature range in low humidity conditions. Optimal storage conditions are:
  - Temperature: -20 ... +25 °C for up to 12 months
    -20 ... +35 °C for up to 6 months
  - Relative humidity: 65 % ±5 %
- Avoid atmosphere with corrosive gas
- Disconnect batteries before store or delivery
- Avoid storage of discharged batteries

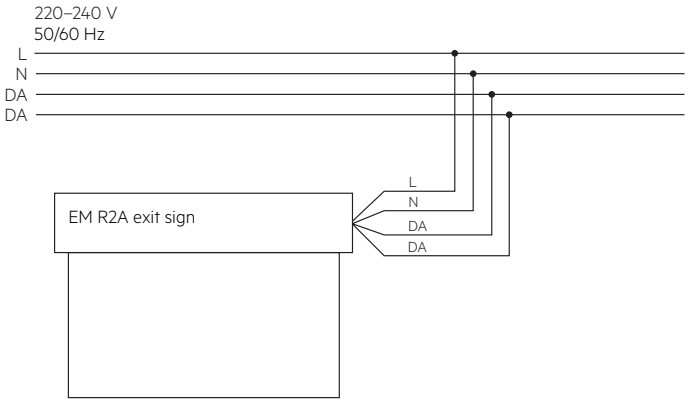
3. Installation / Wiring

3.1 Luminaire assembly

- Wear gloves when mounting the EM ready2apply Exit.
- Use a screwdriver for opening the front cover of the housing.
- Select mounting option:
  - Ceiling
  - Wall
- The mounting holes on the back plate are prepared and can be drilled through with a screwdriver or a drill.
- The mounting holes for ceiling mounting are on the top side and the mounting holes for wall mounting are on the front side of the back plate.
- Fix the back plate on the ceiling or on the wall.
- Wire the mains and DALI terminal block
- Plug the battery into the connector.
- Attach the back plate for the pictograms to the back plate of the housing. Fix the back plate with the hook to the cable ties of the battery to prevent it from falling down.
- Fix the front plate of the housing to the back box. A click will be heard when front plate is inserted correctly.
- Attach a pictogram to the back plate and fix it with brackets at the corners.

Take care when drilling to prevent damage to internal components.

3.2 Wiring diagrams

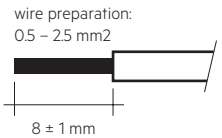


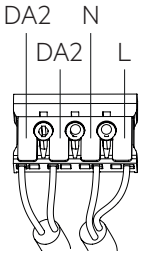
Note: Battery must be connected before mains connection.

3.3 Wiring type and cross-section

Wiring
Mains (N, L)
DALI (DA, DA)

Cable: low smoke, halogen free





Installation of the luminaire only by a qualified person.

4. Mechanical data

4.1 Housing properties

- Polycarbonate white, similar to RAL 9016

4.2 Battery connection

Battery pack connection
3-pole plug connection

4.3 Fixing

Several mounting options possible:
- Ceiling
- Wall

Two easy breakable entry holes at rear and upper part for cable entry.

5. Electrical data

5.1 Maximum loading of automatic circuit breakers

Automatic circuit breaker type	B10	B13	B16	B20	C10	C13	C16	C20	Inrush current	
Installation Ø	1.5 mm²	1.5 mm²	2.5 mm²	2.5 mm²	1.5 mm²	1.5 mm²	2.5 mm²	2.5 mm²	I_{max}	time
EM R2A PRO	90	130	130	130	180	260	260	260	6 A	55 µs

5.2 Insulation matrix

	Mains	Switched Live	Battery, Test switch, Indicator LED	DALI
Mains	–	•	••	•
Switched Live	•	–	••	•
Battery, Test switch, Indicator LED	••	••	–	•
DALI	•	•	•	–

• Represents basic insulation

•• Represents double or reinforced insulation

DALI terminals are not SELV. Wire the terminals in accordance with the requirements of low voltage installations.

5.3 Battery charge regime / discharge

EM R2A PRO Exit 30m, 3 h

	Type	**EM R2A PRO Exit 30m**
	Article no.	**28004648**
	Cells	**2 cells**
	Duration	**3 h**
Battery charge time	Initial	24 h
	Trickle charge	continuously and battery voltage controlled
Typ. charge current[1]	Initial charge	240 – 300 mA
	Trickle charge[1]	240 – 300 mA / 0 mA
Discharge current		430 – 530 mA
Charge voltage range[2]		2.0 – 3.6 V per cell
Discharge voltage range		2.3 – 3.6 V per cell

[1] Automatic recharge when battery voltage falls below 3.4 V. Charger off (0 mA) when battery voltage exceeds 3.6 V.

Note: Battery protected against operation at excessive temperatures (charging stopped when battery cell temperature < 0 °C or > 60 °C)

[2] The battery will not be charged below 2.0 V.

5.4 Battery selection for replacement

EM R2A PRO Exit 30m, 3 h

				Type	**EM R2A PRO Exit 30m**
				Article no.	**28004648**
				Cells	**2 cells**
				Duration	**3 h**
Technology and capacity	Design	Number of cells	**Type**	**Article no.**	**Assignable batteries**
Lithium Iron Phosphate 3 Ah	side by side	2 x 1	**ACCU-LiFePO4 3.0Ah 2B CON**	**28002319**	•

Note: If the rated duration of operation cannot be reached the battery must be replaced. Remove mains during battery replacement.

6. Software / Programming / Interfaces

6.1 Software / programming

With appropriate software and interface different functions can be activated and various parameters can be configured in the LED driver. The Driver supports the following software and interfaces:

Software / hardware for configuration:
- companionSUITE (deviceGENERATOR, deviceCONFIGURATOR, deviceANALYSER)
- masterCONFIGURATOR

Interfaces for data transfer:
- Control input DALI

6.2 Control input DALI

The control input is non-polar for digital control signals (DALI).
The control signal is not SELV. The control cable has to be installed in accordance to the requirements of low voltage installations.

Digital control with:
- DALI signal: 16 bit

7. Functions

⊙ companionSUITE:
DALI-USB
The companionSUITE with deviceGENERATOR, deviceCONFIGURATOR and deviceANALYSER is available via our WEB page:
https://www.tridonic.com/com/en/products/companionsuite.asp

◈ masterCONFIGURATOR:
DALI-USB
The masterCONFIGURATOR is available via our WEB page:
https://www.tridonic.com/com/en/software-masterconfigurator.asp

Icon	Function	DALI-2
	OEM Identification	⊙ ◈
	OEM GTIN	⊙ ◈
	Label information	⊙ ◈
	Factory reset	⊙ ◈
	Device operating mode	⊙ ◈
	Prolong time	⊙ ◈
	Autotest	⊙ ◈
	Test window	⊙ ◈
DALI-2	DALI default parameters	⊙ ◈
	Scenes and group	⊙ ◈

7.1 OEM Identification

The OEM (Original Equipment Manufacturer) can set his own identification number.

7.2 OEM GTIN

The Original Equipment Manufacturer (OEM) can set his own Global Trade Item Number (GTIN).

7.3 Label information

In production, an individual label can be printed out for each device.
For this there are different default values (Batch No., Production Date, ...) available.
In addition, you can use these two text input fields to insert your own luminaire information and print it out.

- Article number (48 characters)
- Description (6 x 48 characters)

This information is not stored on the device, it is only used for the label print function in the deviceCONFIGURATOR.

7.4 Prolong time

Prolong time can be set by the DALI controller.
Here you can set how long the emergency operation will be maintained after power recovery.
The module exits the PROLONG mode as soon as the cut-off threshold of the battery voltage has been reached (total discharge protection), that is when the total operating time has been exceeded.
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.

7.5 Autotest

7.5.1 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.

7.5.2 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.

7.6 Test window

The test window sets the maximum time between the scheduled start time or test request via DALI and the actual execution of the test.
If the test cannot be executed in the test window, the TEST EXECUTION TIMEOUT bit in the FAILURE STATUS is set.

7.7 DALI default parameters

In order for all luminaires to react the same for each operation (switching, dimming, scene recall ...), these values must be set the same.
These DALI standard parameters are supported by every DALI-2 device.

7.8 Scenes and groups

Each device can be a member of up to 16 groups.
Also, 16 different scene values can be stored in each device.

7.9 Status indication

System status is indicated by a bi-colour LED and by a DALI status flag. The indication LED is integrated on the bottom left of the housing.

LED indiction	Status	Comment
Permanent green	System OK	AC mode
Fast flashing green (0,1 sec on – 0,1 sec off)	Function test underway	
Slow flashing green (1 sec on – 1 sec off)	Duration test underway	
Red LED on	Load failure	Open circuit / Short circuit / LED failure
Slow flashing red (1 sec on – 1 sec off)	Battery failure	Battery failed the duration test or function test / Battery is defect or deep discharged / Incorrect battery voltage / Battery is outside of its temperature range for charging (0 – 60 °C)
Fast flashing red (0,1 sec on – 0,1 sec off)	Charging failure	Incorrect charging current
Double pulsing green	DALI Inhibit	Switching into DALI inhibit mode via controller
Binary transmission of address via green/red LED	Address identification	During address identification mode
Green and red off	DC mode	Battery operation (emergency mode)

7.10 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 R2A 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 R2A does not revert to self-testing mode.

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

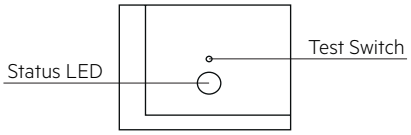
Addressing
The EM R2A includes the EZ easy addressing system which allows addressing and identification by using the bi-colour LED. Binary address codes given by the LED can be simply converted to the DALI addresses 0 to 63. For single handed addressing using this method it is necessary to send a broadcast 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 R2A 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.

Test switch
Test switch is integrated on the bottom left of the housing. 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

To initiate a test use a suitable tool, refer to drawing below.



Note: Press test switch carefully to avoid damaging it.

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.

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 r2a PRO Exit is in emergency operation. The INHIBIT command has to be sent while the EM r2a PRO Exit is supplied by mains. After a mains reset the EM r2a PRO Exit exits the Rest Mode. Rest Mode and Inhibit Mode can both be disabled by sending the RE-LIGHT/RESET INHIBIT command.
In combination with a 1-cell battery the EM r2a PRO Exit does not support Rest Mode / Inhibit Mode.
Max. rest mode duration: 21 days from fully charged battery

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

7.11 Safety

7.11.1 Deep discharge protection

When the battery remains connected without charging for a long period of time after the battery cut off of the driver the battery voltage can still drop. To make sure the cells are not damaged by this voltage drop, the battery protection prevents the battery from further discharge below 2.0 V.

7.11.2 Overcharge protection

If in case of an error or the use of a wrong driver the battery gets overcharged the battery protection will disconnect the battery from the driver at a voltage of 3.9 V. A discharge of the battery is still possible after the protection circuit was triggered to guarantee emergency operation.

7.11.3 Short-circuit protection

In case of a short circuit the battery protection opens the connection to the driver and the output is therefore free of voltage. The output will be reactivated again when the short circuit is removed.

7.11.4 Temperature protection

The battery is protected against temporary thermal overheating. If the temperature limit is exceeded the further charging of the battery is no longer possible. The temperature protection is activated below approx. 0 °C and above approx. +60 °C. The discharging of the battery is still possible to guarantee emergency operation.

7.12 Technical data batteries

Accu Lithium Iron Phosphate

International designation	IFpR 19/66
Battery voltage/cell	3.2 V
Single cell dimensions	
Diameter	18 mm
Height	65 mm
Capacity two cell pack	3.0 Ah
Max. short term temperature (reduced lifetime)	70 °C
Max. number discharge cycles	50 cycles total
Packing quantity	1 pc. per carton

Comply with UN 38.3 and IEC 62133 (safety testing) protected against over charge, over discharge, charging at excessive temperatures, short-circuit and over current.

For battery data see separate data sheet.

8. Miscellaneous

8.1 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.

Do not damage battery and other components during battery replacement.

8.2 Black Box data recording

Recording of several parameters only accessable for Tridonic.

8.3 Additional information

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

The light source of this luminaire is not replaceable; when the light source reaches its end of life replace the whole luminaire. Lifetime declarations are informative and represent no warranty claim. No warranty if device was opened.