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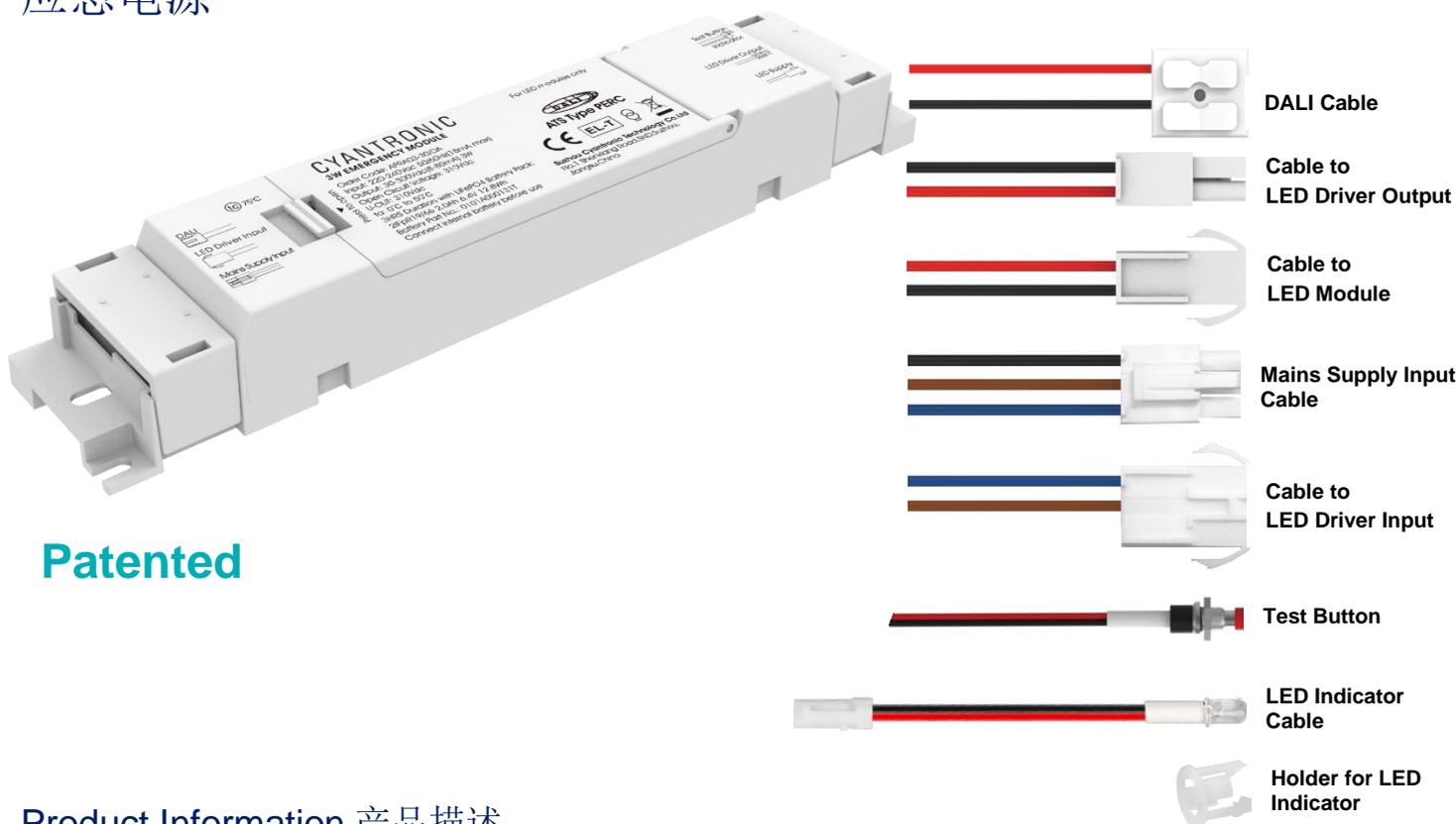
Internal Emergency Module with DALI Interface and Automatic Test Function for LED Linear Luminaires

适用于 LED 线条型灯具的带 DALI 接口和自检功能的内置式应急电源

Patented

DALI Cable

Cable to LED Driver Output

Cable to LED Module

Mains Supply Input Cable

Cable to LED Driver Input

Test Button

LED Indicator Cable

Holder for LED Indicator

Product Information 产品描述

This emergency module with DALI interface and automatic test function can be used built-in for the LED luminaires with integrated LEDs. It is designed for installing within the fitting to provide a battery back-up supply in the event of a power cut. The emergency module requires a permanent live un-switched supply to maintain the battery charge. In the event of a power cut the battery will supply the luminaire at a reduced output.

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.

此具有 DALI 接口和自检功能的应急电源适用于 LED 灯具，可安装于灯具内部。应急电源需要持续通电以维持电池电量。在停电的情况下，电池以较低的功率给灯具中 LED 模组供电。
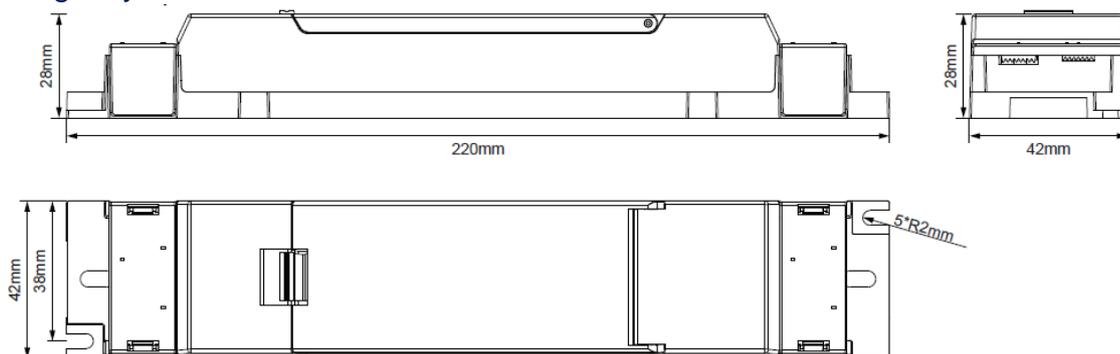
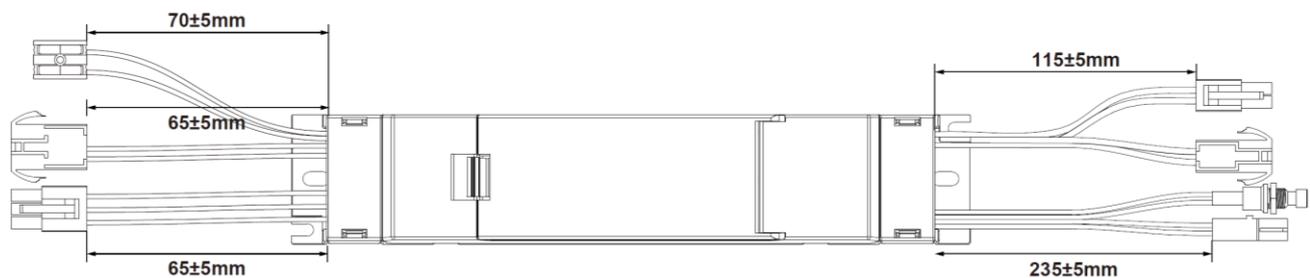由控制装置发出的 DALI 指令可用于在选定的时间启动功能和持续时间测试。设置状态标志用于报告反馈和结果记录。

Features 产品特色

- For maintained or non-maintained emergency lighting systems
- Automatic Self-Test technology conforming to EN 62034
- DALI conforming to EN 62386-101, EN 62386-102, EN 62386-202
- Conforms to EN 61347-1and EN 61347-2-7
- Wired between driver and LED module via internal terminals or wire leads
- Suitable for use in luminaires for high-risk task area lighting
- Voltage change-over threshold according to EN 60598-2-22
- 3 hours rated duration
- Replaceable internal LiFePO4 battery pack
- Over-charge, over-current, short-circuit and deep discharge protection for battery
- Bi-coloured status LED indicator
- Weekly function test and yearly duration test as factory default
- For built-in
- Battery charging temperature control

- 用于持续式或非持续式应急照明灯具
- 自检功能符合标准EN 62034
- DALI符合标准EN 62386-101, EN 62386-102, EN 62386-202
- 符合EN61347-1,EN61347-2-7
- 通过端子或电线与电源及LED模组接线
- 适用于高风险任务区照明的灯具
- 应急转换符合标准 EN 60598-2-22
- 3小时应急工作时间
- 内置的且方便更换的磷酸铁锂电池组
- 具有过充,过流,短路,电池深度放电保护功能
- 双色状态指示灯
- 出厂设置为每周功能检测年度持续时间检测
- 内置式应用
- 电池充电温度控制
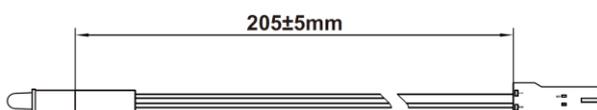
Dimensions 产品尺寸

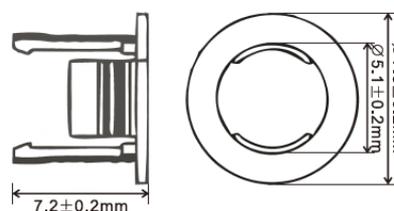## Emergency Module 应急模块

Input and Output Cabel 输入输出电线

LED Indicator Cable
LED 指示灯电线

Indicator Holder
指示灯固定座

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Specifications 产品参数

Product Code 产品型号	APRA03-30/DA
Input Parameters 输入参数	
Rated Input Voltage Range 额定工作电压范围	**220-240Vac**
Operation Input Voltage Range 输入电压范围	**198-264Vac**
Input frequency 工作频率	**50/60Hz**
Input Wattage (max) 输入功率（最大值）	**3.5W @Rated Input Voltage & Battery full discharge** **3.5W @额定工作电压输入及电池完全放电后**
Input Current (max) 输入电流（最大值）	**18mA @Rated Input Voltage & Battery full discharge** **18mA @额定工作电压输入及电池完全放电后**
Input PF 功率因数	**PF:0.75 @Rated Input Voltage & Battery full discharge** **PF:0.75 @额定工作电压输入及电池完全放电后**
Overvoltage Protection 过压保护	**No**
Input Connection 输入端连接方式	**Wiring leads with connector** **带端子电线**
Output Parameters 输出参数	
Regulation Method 恒定方式	**Constant Wattage** **恒功率**
Battery Output Wattage(max) 电池输出功率(最大值)	**3W Max**
Rated Output Wattage 额定输出功率	**2.5W Max**
Rated Output Voltage Range 额定输出电压范围	**30-300Vdc**
Rated Output Current Range 额定输出电流范围	**8-80mA**
Max. Open Circuit Voltage 最大开路电压	**310Vdc**
U-OUT	**310Vdc**
Short-circuit Protection 短路保护	**Yes (For battery)**
Open Circuit Protection 开路保护	**No**
Output Connection 输出端连接方式	**Wiring leads with connector** **带端子电线**
Output Hot Plug-in 输出热拔插	**When the driver is powered on and the battery is connected,** **reconnecting the LED luminaire is not allowed.** **通电状态下，不允许重新插拔负载**

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Safety 安全	
Input to Output Protection 输入到输出防护等级	**Double Insulation** **双重绝缘**
Battery to Output Protection 电池到输出防护等级	**Basic Insulation** **基本绝缘**
Mains Surge Capability 雷击	**L-N:1KV**
IP Protection IP 等级	**IP20, Built-in Driver** **IP20，内置式电源**
Emergency Information 应急信息	
Mains Voltage Changeover Threshold 应急转换电压范围	**144-187Vac**
Emergency Operation Time 应急工作时间	**3h**
Emergency Conversion Time 应急转换时间	**<1s**
Test Function 检测方式	**DALI-2 interface / Automatic test** **DALI-2 接口 / 自测试** **Refer to DALI-2 Emergency Module User Guide** **参考 DALI 应急用户指南**
Environment & Life time 环境&寿命	
Operating Temperature Range 工作环境温度	**Ta:0 to 50°C**
Maximum Case Temperature 外壳最高温度	**Tc:75°C**
Operating Humidity 工作环境湿度	**<75% RH (Not Condensing)**
Operating Altitude 工作海拔高度	**≤3000m**
Driver Storage temp./humidity 驱动储存温度/湿度	**-20-50℃(≤75% RH)**
Driver Guarantee 驱动保修期	**5 Years** **5 年**
Certifications and Standards 认证和标准	
Certifications 认证	**ENEC, CB, CE, RCM**
Safety 安全	**EN 61347-1, EN 61347-2-7**
EMC	**EN 55015, EN 61000-3-2, EN 61000-3-3, EN 61547**
DALI-2	**EN 62386-101, EN 62386-102, EN 62386-202**
RoHS	**Directive 2011/65/EU with amendment (EU) 2015/863**

Reach	No.1907/ 2006(EC) SVCH 240
Patent 专利	
EP3229557B1	**EMERGENCY LIGHTING**
CN109640479B	一种兼恒功率输出的应急驱动的照明装置

Battery Pack 电池组	
Battery Model 电池型号	**2IFpR19/66 2.0Ah 6.4V**
Cell Type 电芯规格	**LiFePO4 18650 3.2V 2000mAh**
Number of cells 电芯数量	**2**
Series-parallel Combination 串并联方式	**2S1P**
Rated Battery Capacity 标称电池容量	**2000mAh**
Rated Battery Voltage 标称电池电压	**6.4V**
Battery Energy 电池能量	**12.8Wh**
Battery Charge Voltage 电池充电电压	**7.3±0.1V**
Battery Charge Current 电池充电电流	**Max.180mA**
Battery Discharge Voltage 电池放电电压	**5.0-7.2V**
Battery Discharge Current 电池放电电流	**450-480mA**
Charging Time 充电时间	**24h**
Charge Temperature Range Tcmin-Tcmax 充电温度范围	**0 to 65°C**
Battery Design Life 电池设计寿命	**5 Years at 50℃**
Max. storage time 最长储存时间	**12 months at +5 °C to +25 °C**

Customizable Accessories 可定制配件

Type 类型	**Description** 描述
LED indicator & Test button cable 指示灯及测试按钮线	**Bi-coloured status LED indicator and test button cable with 4-pole plug** 带4位连接器的双色状态指示灯和测试按钮电线

Mains Supply Input Cable 市电输入线	3-pole wiring leads with connector for connecting to mains supply 3 芯电线，含与市电输入端连接的端子
Cable to LED Driver Input LED 驱动输入线	2-pole wiring leads with connector for connecting to LED driver output 2 芯电线，含与 LED 电源输入端连接的端子
Output Cable to LED Module 输出线	2-pole wiring leads with connector for connecting to LED module 2 芯电线，含与 LED 模组连接的端子
Output Cable to LED Driver Output 输出线	2-pole wiring leads with connector for connecting to LED driver output 2 芯电线，含与 LED 电源输出端连接的端子
DALI cable DALI 线	2-pole wiring leads with connector for connecting to DALI 2 芯电线，含与 DALI 信号线连接的端子

Wiring Diagram接线图

Driver output current ≤ 2A 驱动输出电流≤2A
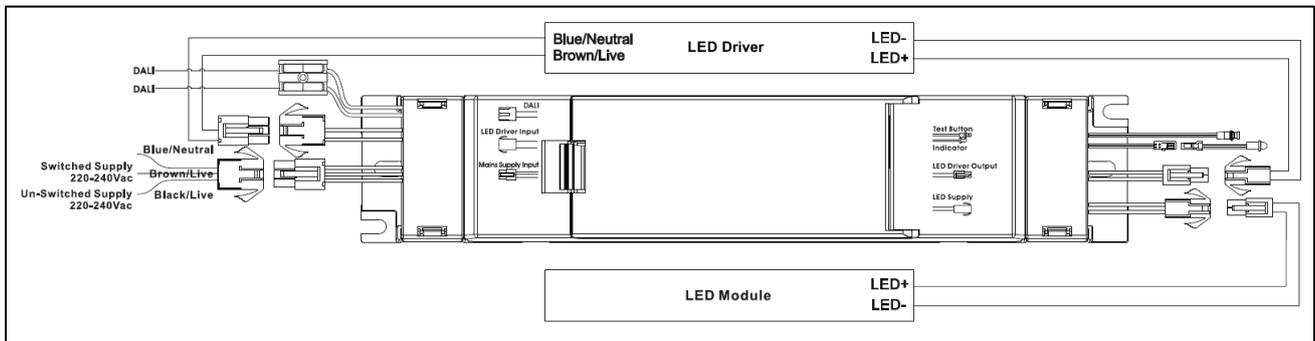
DALI-2 Emergency Module User Guide

Commissioning

- Commissioning takes place by connecting the battery and then the un-switched supply. The battery must be connected first.
- The green LED will immediately flash 1 x second to indicate that there is a pending duration test.
- A duration test will occur at a random point between 24 hours and 48 hours after commissioning to allow up to 24 hours for battery charging.
- Any faults found in the duration testing will be reported via the LED indicator, as detailed below and using the DALI-2 protocol.
- Disconnecting the un-switched supply and then the battery resets the emergency module, clears all fault reports and forces a re-commission when the battery and then the un-switched supply are reconnected.
- The factory presets specify that the functional test is performed every 7 days and the duration test every 52 weeks. Disconnecting the un-switched supply and then the battery resets the emergency module's schedule, this means that a function test will be performed 7 days form the time of reset and a duration test will be performed in 52 weeks.

Duration Testing (3 hours)

- An automatic duration test will occur at a random point between 24 hours and 48 hours after commissioning to allow for battery charging.
- An automatic duration test will occur annually at a random point in the 52nd week after commissioning, unless the DELAY time and INTERVAL time are modified by appropriate commands via the DALI bus.
- A duration test will occur once the battery is fully charged after pressing the manual test button for 5-10 seconds, or after being instructed to do so using the DALI-2 protocol.
- A duration test may be delayed by other events, such as a power cut that interrupts the test or a lack of charging time, in which case the green LED will continue to flash 1 x second to indicate there is a pending duration test.
- Any faults found in the duration test will be reported via the LED indicator, as detailed above as well as over the DALI-2 protocol.
- A functional test will not override Battery Duration Fault. A full duration test or re-commissioning is required to clear such fault.

Functional Testing (<2 minutes)

- A short automatic functional test will occur every 7 days, unless the DELAY time and INTERVAL time are modified by appropriate commands via the DALI bus.
- A manual functional test will occur immediately after pressing the manual test button for 1-2 seconds, or when instructed to do so using the DALI-2 protocol.
- Any faults found in the functional test will be reported via the LED indicator, as detailed above as well as over the DALI-2 protocol.
- A functional test will not override Battery Duration Fault. A full duration test or re-commissioning is required to clear such fault.

Manual Testing

- Manual functional test: Press the manual test button for 1-2 seconds. A manual functional test lasting <2 minutes will start immediately.
- Manual duration test: Press the manual test button for 5-10 seconds. A manual duration test will occur once the battery is fully charged after pressing the manual test button for 5-10 seconds.

Pending Duration Testing

- A duration test may be delayed by events, such as a power cut that interrupts the test or charging period, in which case the green LED will flash to indicate there is a pending duration test and that the emergency module has rescheduled until charging is complete.

Lamp or Luminaire Fault

- Turn off the supply and replace or correct the fault with the lamp or luminaire, and then reconnect the supply.
- Press the manual test button for 1-2 seconds or using the DALI-2 protocol. A functional test lasting <2 minutes will start immediately to clear the fault.
- Alternatively press the manual test button for 5-10 seconds or using the DALI-2 protocol. A manual duration test will occur once the battery is fully charged.
- If the battery and power have been disconnected the emergency module will re-commission and automatically test the replacement.
- A functional test will not override Battery Duration Fault. A full duration test or re-commissioning is required to clear such fault.

Battery or Duration Fault

- Turn off both the un-switched and switched supply and replace the battery, and then reconnect the supply.
- If the battery fault was due to the battery not being connected, both the un-switched and switched supply must off when connecting the battery to clear the battery fault.
- The emergency module will re-commission and so automatically test the replacement at a random point between 24 and 48 hours after commissioning to allow for battery charging.

Rest Mode

- Emergency operation is automatically started when the mains supply is switched off. Rest mode can be activated during emergency mode by doubling press the manual test button. The discharging of the battery will be minimized by switching off the LED output. The rest mode will be exited automatically after reconnect the supply.
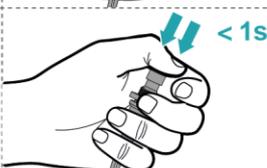
LED Indicator
System status is locally indicated by a bi-coloured LED indicator.

LED indication		Description	Status
		Green Permanently On	System Healthy
		Permanently OFF	Emergency Mode: Mains failure or mains disconnected
		Green Slow Flash (0.5s on-0.5s off)	Duration Test Pending
		Green Medium Flash (0.25s on-0.25s off)	Duration Test Running
		Green Fast Flash (0.125s on-0.125s off)	Functional Test Running
		Red Permanently On	Battery Charging Fault
		Red Medium Flash (0.25s on-0.25s off)	Battery Duration Fault
		Red Fast Flash (0.125s on-0.125s off)	Lamp or Luminaire Fault
		Green Fast Flash Twice (0.1s on-0.1s off) then off 1s	Inhibit Mode Activated

Functionality of the test button
The test button enables you to make a series of settings manually.

Test button		Description	Function
	1-2s	Press 1-2s	Manual functional test
	5-10s	Press 5-10s	Manual duration test
	< 1s	Double press <1s during emergency mode	Rest mode activated