

# α-i Plus

## Standard and Self-Test 2 in 1 Internal Emergency Module for LED Linear Luminaires with Isolated Driver

适用于隔离电源的 LED 线条形灯具的标准/自检 2 合 1 内置式应急电源

**Patented**



### Product Information 产品描述

This emergency module is used in LED luminaires with integrated LEDs and separate LED drivers. 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 luminaires at a reduced output.

It is provided with self-test mode and annual duration test as default. Automatic Self-Test technology that will perform regular automatic function and duration tests as required by EN 62034, reporting the results via a bi-coloured LED indicator.

此应急电源适用于 LED 灯具，并安装于灯具内部。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。

应急电源出厂默认设置为自测试模式、每年度放电时间检测，自检功能指按照 EN62034 的要求执行定期的自动功能和持续时间测试，并通过双色 LED 指示灯报告结果。

## Features 产品特点

- Triple-press test button to change test mode (standard/self-test)
- Double-press test button to change duration test interval (26weeks/52weeks)
- For LED modules with a forward voltage of 20-55Vdc
- For maintained or non-maintained emergency lighting systems
- Automatic Self-Test technology conforming to EN 62034
- Conforms to EN 61347-1 and EN 61347-2-7
- Wired between LED driver and LED module via terminals
- 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
- 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/semi-yearly duration test for self-test mode
- Constant power output
- For built-in
- Battery charging temperature control
- 三击测试按钮设置标准/自测试模式
- 双击测试按钮设置持续时间检测周期 (26周/52周)
- 适用于电压为20-55Vdc的LED模组
- 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
- 符合标准EN 61347-1,EN 61347-2-7
- 通过端子与电源及LED模组连线
- 适用于高风险任务区照明灯具
- 应急转换符合标准EN60598-2-22
- 3小时应急工作时间
- 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
- 自检模式下，每周功能检测,每年/每半年持续时间检测
- 恒功率输出
- 内置式应用
- 电池充电温度控制

## Specifications 产品参数

<b>Product Code</b> 产品型号	<b>AIP20-30/MC/ST</b>
<b>Input Parameters</b> 输入参数	
<b>Rated Input Voltage Range</b> 额定工作电压范围	<b>220-240Vac</b>
<b>Operation Input Voltage Range</b> 输入电压范围	<b>198-264Vac</b>
<b>Input frequency</b> 工作频率	<b>50/60Hz</b>
<b>Input Wattage (max)</b> 输入功率 (最大值)	<b>11W @Rated Input Voltage &amp; Battery full discharge</b> <b>11W @额定工作电压输入及电池完全放电后</b>
<b>Input Current (max)</b> 输入电流 (最大值)	<b>60mA @Rated Input Voltage &amp; Battery full discharge</b> <b>60mA @额定工作电压输入及电池完全放电后</b>
<b>Input PF</b> 功率因数	<b>PF:0.85 @Rated Input Voltage &amp; Battery full discharge</b> <b>PF:0.85 @额定工作电压输入及电池完全放电后</b>
<b>Overvoltage Protection</b> 过压保护	<b>No</b>
<b>Input Connection</b> 输入端连接方式	<b>Push-fit terminals 0.5-1.5mm<sup>2</sup></b> <b>按压快接端子 0.5-1.5mm<sup>2</sup></b>

<b>Output Parameters</b> 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)	20W Max
Rated Output Wattage 额定输出功率	16W Max
Rated Output Voltage Range 额定输出电压范围	20-55Vdc
Rated Output Current Range 额定输出电流范围	290-800mA
Max. Open Circuit Voltage 最大开路电压	60Vdc
U-OUT	60Vdc
Short-circuit Protection 短路保护	Yes (For battery)
Open Circuit Protection 开路保护	Yes
Output Connection 输出端连接方式	Push-fit terminals 0.5-1.5mm <sup>2</sup> 按压快接端子 0.5-1.5mm <sup>2</sup>
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
<b>Safety</b> 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
<b>Emergency Information</b> 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	Automatic Self-Test / Manual test 自测试/手动测试 Refer to Automatic / Manual Testing User Guide 参考自测试/手动测试用户指南

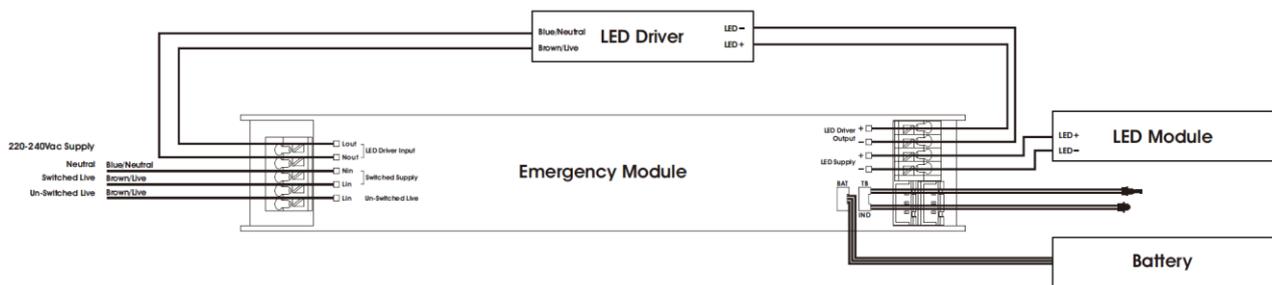
<b>Environment &amp; Life time</b> 环境&寿命	
<b>Operating Temperature Range</b> 工作环境温度	Ta:0 to 50°C
<b>Maximum Case Temperature</b> 外壳最高温度	Tc:75°C
<b>Operating Humidity</b> 工作环境湿度	<75% RH (Not Condensing)
<b>Operating Altitude</b> 工作海拔高度	≤3000m
<b>Driver Storage temp./humidity</b> 驱动储存温度/湿度	-20-50°C(≤75% RH)
<b>Driver Guarantee</b> 驱动保修期	5 Years 5 年
<b>Certifications and Standards</b> 认证和标准	
<b>Certifications</b> 认证	CE
<b>Safety</b> 安全	EN 61347-1, EN 61347-2-7
<b>EMC</b>	EN 55015, EN 61000-3-2, EN 61000-3-3, EN 61547
<b>RoHS</b>	Directive 2011/65/EU with amendment (EU) 2015/863
<b>Reach</b>	No.1907/ 2006(EC) SVCH 240
<b>Patent</b> 专利	
EP3229557B1	EMERGENCY LIGHTING
CN109640479B	一种兼恒功率输出的应急驱动的照明装置

<b>Battery Pack</b> 电池组	
<b>Battery Model</b> 电池型号	3IFpR27/72-2 10.0Ah 9.6V
<b>Cell Type</b> 电芯规格	LiFePO4 26700 3.2V 5000mAh
<b>Number of cells</b> 电芯数量	1
<b>Rated Battery Capacity</b> 标称电池容量	10000mAh
<b>Rated Battery Voltage</b> 标称电池电压	9.6V
<b>Battery Charge Voltage</b> 电池充电电压	10.8V±0.1V
<b>Battery Charge Current</b> 电池充电电流	Max.720mA

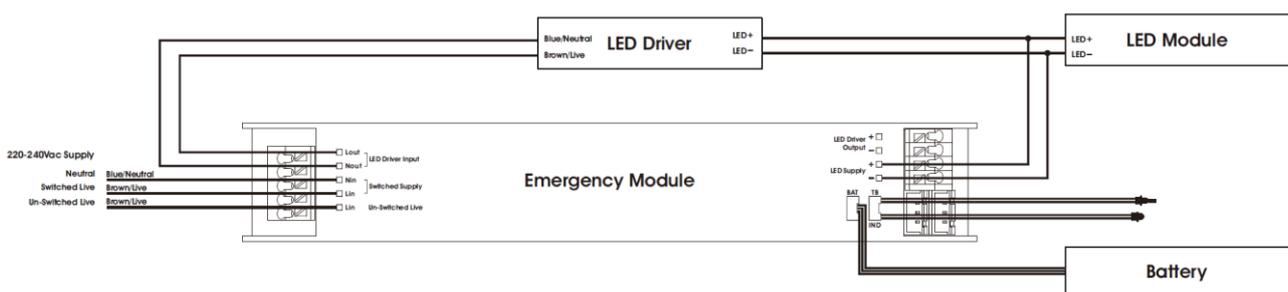
Battery Discharge Voltage 电池放电电压	7.5-10.8V
Battery Discharge Current 电池放电电流	1800-2500mA
Charging Time 充电时间	24h
Charge Temperature Range Tcmin-Tcmax 充电温度范围	0 to 65°C
Battery Design Life 电池设计寿命	5 Years at 50°C
Max. storage time 最长储存时间	12 months at +5 °C to +25 °C

## Wiring Diagram 接线图

Driver output current  $\leq 2A$  驱动输出电流  $\leq 2A$



Drive output current  $> 2A$  驱动输出电流  $> 2A$



## Self-Test Mode: Automatic / Manual Testing 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 functional test will occur at 5 minutes after commissioning to allow 5 minutes for battery charging to ensure there is some charge in the battery.
- A duration test will occur at a random point between 24 hours and 48 hours after commissioning to allow 24 hours for battery charging.
- Any faults found in the functional and duration testing will be reported via the LED indicator, as detailed below.
- 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.
- **If the un-switched supply of an emergency lighting circuit is switched OFF/ON twice within 5 seconds, the schedule for all the emergency units in the emergency lighting circuit is reset (to the current time).**

### 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 semi-annually or annually at a random point in the 26<sup>nd</sup> or 52<sup>nd</sup> week of each year.
- A duration test will occur once the battery is fully charged after pressing the manual test button for 5-10 seconds.
- 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 flash 1 x second to indicate there is a pending duration test that the emergency module has rescheduled.
- Any faults found in the duration testing will be reported via the LED indicator, as detailed below.
- A functional test will not override any faults reported by a duration test. A full duration test or re-commissioning is required to clear any faults.

### Functional Testing (<2 minutes)

- A 5 seconds automatic functional test will occur at 5 minutes after commissioning.
- A 108 seconds automatic functional test will occur every 7 days.
- A manual 108 seconds functional test will start immediately after pressing the manual test button for 1-2 seconds.
- Any faults found in the functional testing will be reported via the LED indicator, as detailed below.
- A functional test will not override any faults reported by a duration test. A full duration test or re-commissioning is required to clear any faults.

### 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 other 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 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. A manual functional test lasting <2 minutes will start immediately to clear the fault.
- Alternatively press the manual test button for 5-10 seconds. 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 successful functional test will not override any faults reported by a duration test. A full duration test or re-commissioning is required to clear fault reports.

### Battery 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.

## Standard Mode: Manual Testing User Guide

- The battery leaves the factory in a semi-charged state but may take up to 24 hours to fully charge for a 3-hour test. Charge for 5 minutes before performing a functional test to ensure there is some charge in the battery.
- To fully test the emergency function, the un-switched supply will need to be switched off. A quick functional test can be performed by pressing the test button.
- Replace the battery when the emergency module fails to meet the 3-hour duration requirement in testing.

## 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	Standard Mode	Self-test Mode
		Green Permanently On	System Healthy	✓	✓
		Permanently OFF	Emergency Mode: Mains failure or mains disconnected	✓	✓
			Battery disconnected	✓	N/A
		Green Slow Flash (0.5s on-0.5s off)	Duration Test Pending	N/A	✓
		Green Medium Flash (0.25s on-0.25s off)	Duration Test Running	N/A	✓
		Green Fast Flash (0.125s on-0.125s off)	Functional Test Running	N/A	✓
		Red Permanently On	Battery Charging Fault	N/A	✓
		Red Medium Flash (0.25s on-0.25s off)	Battery Duration Fault	N/A	✓
		Red Fast Flash (0.125s on-0.125s off)	Lamp or Luminaire Fault	N/A	✓
		OFF 1s then Red Stay On 5s	26 Weeks Duration Test Interval	N/A	✓
		OFF 1s then Red Fast Flash 5s (0.125s on-0.125s off)	52 Weeks Duration Test Interval	N/A	✓
		OFF 1s then Green Fast Flash 5s (0.125s on-0.125s off)	Standard mode	✓	N/A
		OFF 1s then Green/Red Fast Flash 5s (0.125s on-0.125s off)	Self-test mode	N/A	✓

### Functionality of the test button

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

Test button		Description	Function	Standard Mode	Self-test Mode
		Hold down	Manual functional test	✓	N/A
		Press 1-2s	Manual functional test	N/A	✓
		Press 5-10s	Manual duration test	N/A	✓
		Press <1s	Confirm the current duration test interval	N/A	✓
		Double press <1s	Set the duration test interval	N/A	✓
		Double press <1s during emergency mode	Rest mode activated	✓	✓
		Triple press <2s	Set test mode (Standard/Self-test)	✓	✓