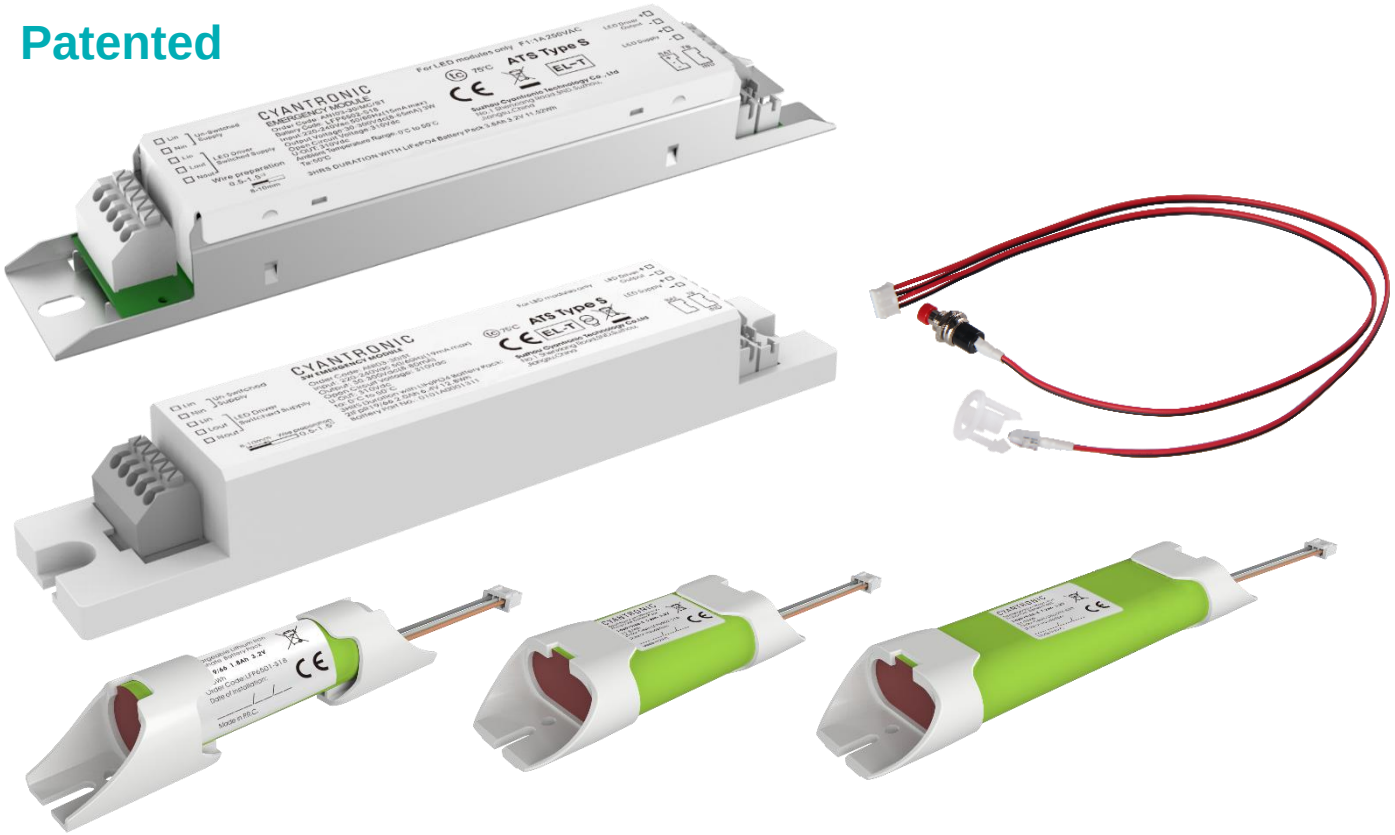
α-i

Manual & Self-test 2 in 1 Internal Emergency Module for LED Linear Luminaires with Isolated Driver

Patented



Product Information

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.

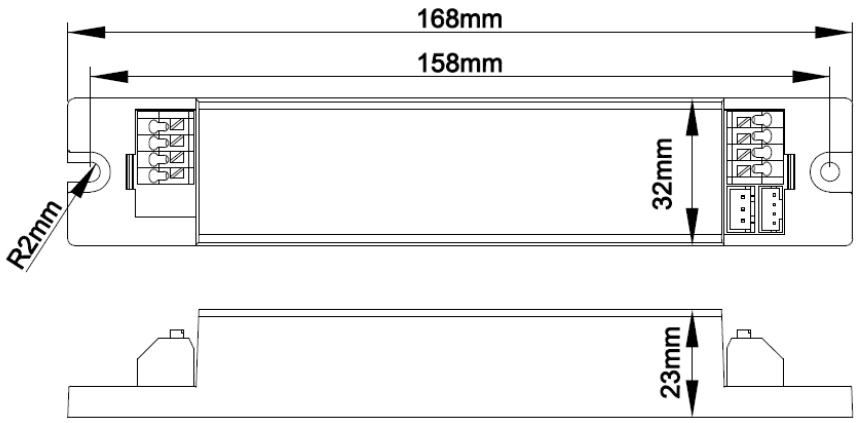
Features

- Triple-press test button to change test mode (manual/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
- 1.5 hours or 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

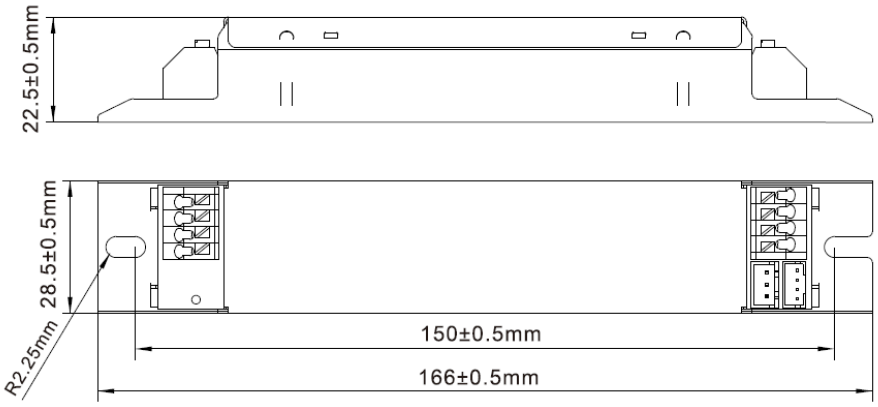
Dimensions

Emergency Module

Plastic

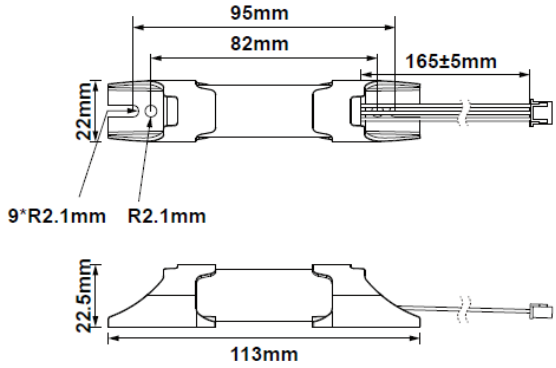


Metal

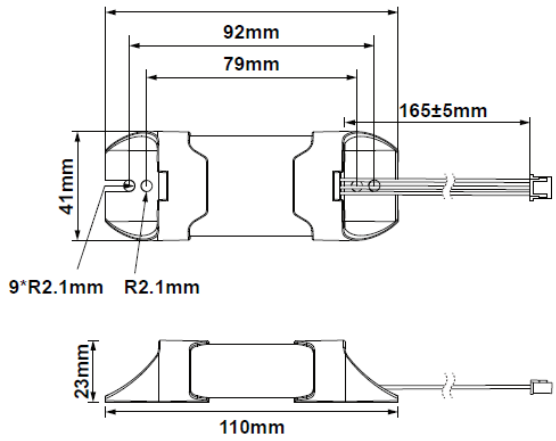


Battery Pack

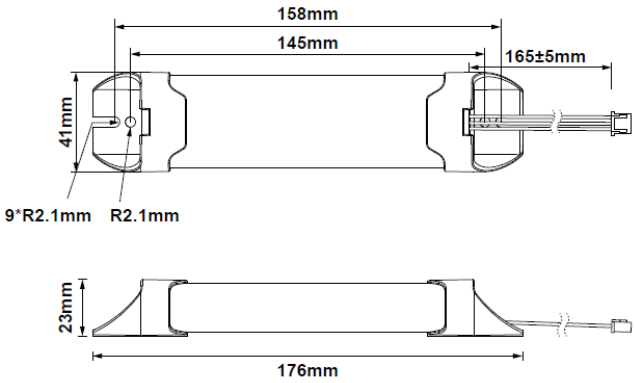
1IFpR19/66 1.8Ah 3.2V



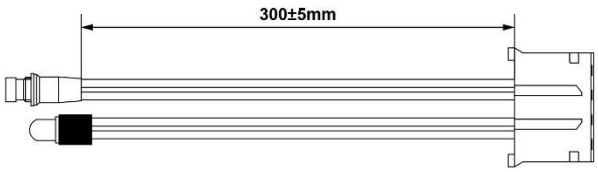
2IFpR19/66 2.0Ah 6.4V



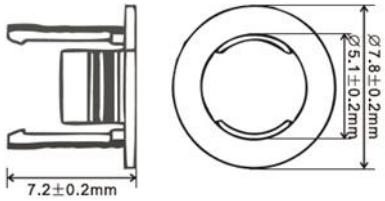
2IFpR19/66-2 4.0Ah 6.4V



Indicator&Test Button Cable



Indicator Holder



Specifications

Product Code	AI03-30/ST AI03-30/MC/ST	AI03-15/ST AI03-15/MC/ST	AI05-30/ST AI05-30/MC/ST	AI05-15/ST AI05-15/MC/ST
Input Parameters				
Rated Input Voltage Range	220-240Vac			
Operation Input Voltage Range	198-264Vac			
Input frequency	50/60Hz			
Input Wattage (max)	3.5W @Rated Input Voltage & Battery full discharge		4W @Rated Input Voltage & Battery full discharge	
Input Current (max)	19mA @Rated Input Voltage & Battery full discharge		21mA @Rated Input Voltage & Battery full discharge	
Input PF	PF:0.8 @Rated Input Voltage & Battery full discharge		PF:0.8 @Rated Input Voltage & Battery full discharge	
Overvoltage Protection	No			
Input Connection	Push-fit terminals 0.5-1.5mm^2			
Output Parameters				
Regulation Method	Constant Wattage			
Battery Output Wattage(max)	3W Max		5W Max	
Rated Output Wattage	2.5W Max		4W Max	
Rated Output Voltage Range	20-55Vdc			
Rated Output Current Range	45-125mA		73-200mA	
Max. Open Circuit Voltage	60Vdc			
U-OUT	60Vdc			
Short-circuit Protection	Yes (For battery)			
Open Circuit Protection	Yes (For Self-test mode)			
Output Connection	Push-fit terminals 0.5-1.5mm^2			
Output Hot Plug-in	When the driver is powered on and the battery is connected, reconnecting the LED luminaire is not allowed.			
Safety				
Input to Output Protection	Double Insulation			
Battery to Output Protection	Basic Insulation			
Mains Surge Capability	L-N:1KV			
IP Protection	IP20			

Emergency Information				
Mains Voltage Changeover Threshold	144-187Vac			
Emergency Operation Time	3h	1.5h	3h	1.5h
Emergency Conversion Time	<1s			
Test Function	Automatic test / Manual test Refer to Automatic / Manual Testing User Guide			
Environment & Life time				
Operating Temperature Range	Ta:0 to 50°C			
Maximum Case Temperature	Tc:75°C			
Operating Humidity	<75% RH (Not Condensing)			
Operating Altitude	≤3000m			
Driver Storage temp./humidity	-20-50℃(≤75% RH)			
Driver Guarantee	5 Years 5 年			
Certifications and Standards				
Certifications	ENEC, CB, CE, RCM			
Safety	EN 61347-1, EN 61347-2-7			
EMC	EN 55015, EN 61000-3-2, EN 61000-3-3, EN 61547			
RoHS	Directive 2011/65/EU with amendment (EU) 2015/863			
Reach	No.1907/ 2006(EC) SVCH 240			
Patent				
EP3229557B1	EMERGENCY LIGHTING			
CN109640479B	一种兼恒功率输出的应急驱动的照明装置			

Battery Pack			
Battery Model	1IFpR19/66 1.8Ah 3.2V (for 3W 1.5h)	2IFpR19/66 2.0Ah 6.4V (for 3W 3h / 5W 1.5h)	2IFpR19/66-2 4.0Ah 6.4V (for 5W 3h)
Cell Type	LiFePO4 18650 3.2V 1800mAh	LiFePO4 18650 3.2V 2000mAh	LiFePO4 18650 3.2V 2000mAh
Number of cells	1	2	4
Series-parallel Combination	1S1P	2S1P	2S2P
Rated Battery Capacity	1800mAh	2000mAh	4000mAh
Rated Battery Voltage	3.2V	6.4V	6.4V
Battery Energy	5.76Wh	12.8Wh	25.6Wh

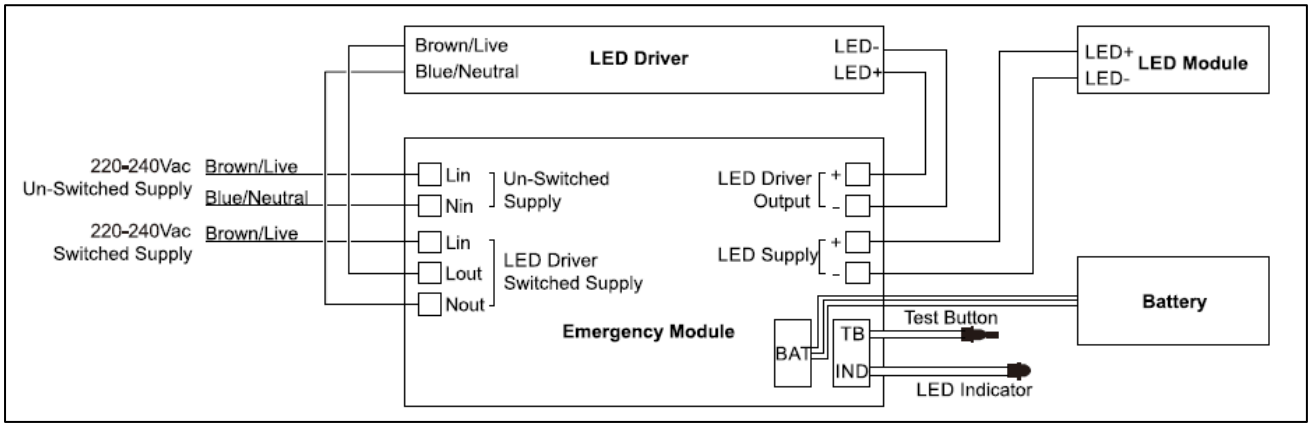
Battery Charge Voltage	**3.65±0.1V**	**7.3±0.1V**	**7.3±0.1V**
Battery Charge Current	**Max.250mA**	**Max.250mA**	**Max.280mA**
Battery Discharge Voltage	**2.5-3.6V**	**5.0-7.2V**	**5.0-7.2V**
Battery Discharge Current	**900-960mA**	**450-480mA(3W,3h) 750-870mA(5W,1.5h)**	**750-870mA**
Charging Time	**24h**	**24h**	**24h**
Charge Temperature Range Tcmin-Tcmax	**0 to 65°C**	**0 to 65°C**	**0 to 65°C**
Battery Design Life	**5 Years at 50℃**	**5 Years at 50℃**	**5 Years at 50℃**
Max. storage time	**12 months at +5 °C to +25 °C**	**12 months at +5 °C to +25 °C**	**12 months at +5 °C to +25 °C**

Customizable Accessories

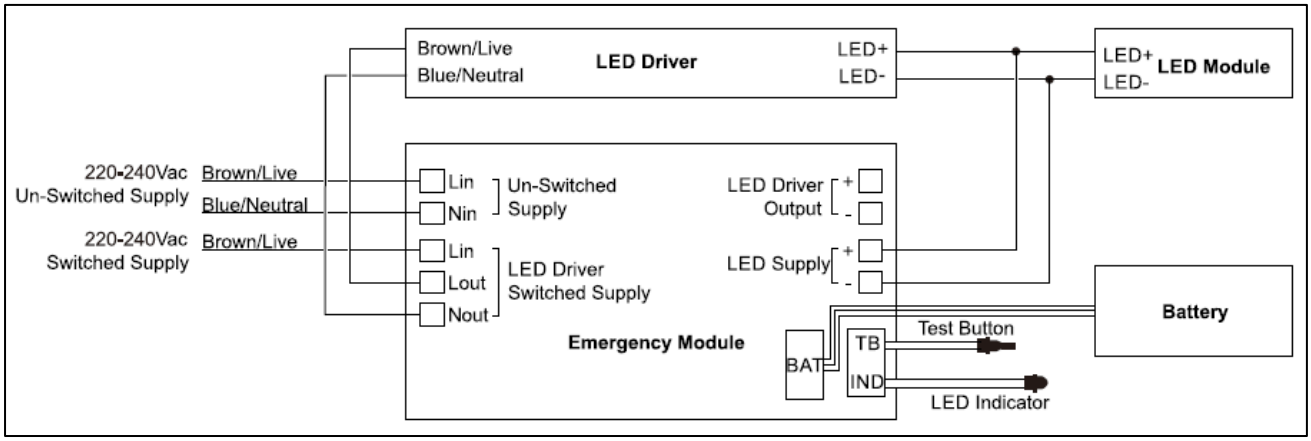
Type	Description
LED indicator & Test button cable	**Bi-coloured status LED indicator and test button cable with 4-pole plug**
Extension cable for battery	**Extension cable for battery with 3-pole plug, available in 75mm or 130mm**

Wiring Diagram

Driver output current ≤ 2A



Drive output current＞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 26nd or 52nd 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.

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