DALI Economy LED Drivers
DALI/1-10V/Switch-Dim

HYTRONIK®

HED2020 / HED2040 / HED2050 / HED2060

DALI ⑤Intertek **CB** ◬ CE
SELV IP20 ▫ ▽F emc

Applications

Ideal for use with 'plug n' play' or DALI broadcast master.
Fully addressable DALI systems which do not require feedback.

Suitable for LED panels - insulated terminal cover with cord restraint:

■ Office / Commercial Lighting
■ Health Care
■ Classrooms

Use for retrofit upgrades & new luminaire designs.

Features

▭ DALI

▭ 1-10V (HED2040 / HED2050 only)

▭ ▭ Switch-Dim with Synchronization

▭ Active PFC Design

▭ Hybrid Flicker-free Dimming

▭ Configurable Constant Current (CC) Output via Dip-Switch

▭ Logarithmic Dimming

▭ Linear Dimming

▭ Thermal Cut-out Protection ⎫
▭ Short Circuit Protection ⎬ All with Auto-restart
▭ Over-load Protection ⎭

▭ Permanent Settings Memory, Protected against Loss of Power

▭ 5 Year, 50,000hr Warranty

Output Configuration

HED2020, 1x20W

24V	
12V	
900mA	
700mA	
500mA	
350mA	

HED2040, 1x40W

350mA, 400mA, 450mA, 500mA, 550mA, 600mA, 650mA, 700mA, 750mA, 800mA, 850mA, 900mA, 950mA, 1000mA, 1050mA, 1100mA

HED2050, 1x50W

700mA, 750mA, 800mA, 850mA, 900mA, 950mA, 1000mA, 1050mA, 1100mA, 1150mA, 1200mA, 1250mA, 1300mA, 1350mA, 1400mA

HED2060, 1x60W

2.10A, 2.00A, 1.75A, 1.60A, 1.40A, 1.20A, 1.05A

⚠ Warning: Please make sure the correct current is selected before starting the driver!

Technical Data

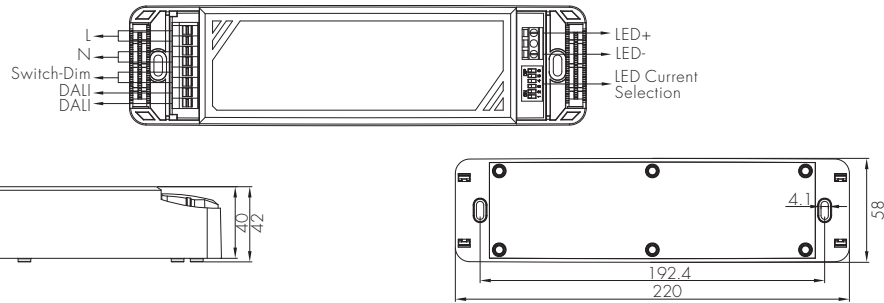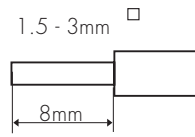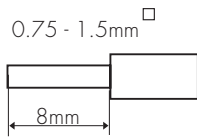| Model No.		HED2020	HED2040	HED2050	HED2060
Input	Mains Voltage	220~240VAC 50/60Hz			
	Mains Current	0.125 ~ 0.115A	0.23 ~ 0.21A	0.3 ~ 0.25A	0.35 ~ 0.27A
	Power Factor	0.93	0.95	0.95	0.95
	Max. Efficiency	85%	88%		
	Dielectric Strength	Input→Output : 3000VAC			
	Leakage Current	<0.25mA			
Output	Power/Current/Voltage Range	15W/350mA /9~45V 20W/500mA /9~43V 20W/700mA /9~30V 20W/900mA /9~23V Constant Voltage 10W /12V 20W /24V	20W/350mA /12~58V 23W/400mA /12~58V 26W/450mA /12~58V 29W/500mA /12~58V 32W/550mA /12~58V 35W/600mA /12~58V 38W/650mA /12~58V 40W/700mA /12~58V 42W/750mA /12~56V 45W/800mA /12~56V 45W/850mA /12~53V 45W/900mA /12~50V 45W/950mA /12~47V 45W/1000mA /12~45V 45W/1050mA /12~43V 45W/1100mA /12~41V	40.5W/700mA /12~58V 43.5W/750mA /12~58V 46.5W/800mA /12~58V 49W /850mA /12~58V 50W /900mA /12~56V 50W /950mA /12~53V 50W /1000mA/12~50V 50W /1050mA/12~48V 50W /1100mA/12~45V 50W /1150mA/12~43V 50W /1200mA/12~42V 50W /1250mA/12~40V 50W /1300mA/12~38V 50W /1350mA/12~37V 50W /1400mA/12~36V	55W/1.05A/16~53V 60W/1.2A /16~50V 60W/1.4A /16~43V 60W/1.6A /16~38V 60W/1.75A/16~35V 60W/2.0A /16~30V 60W/2.1A /16~28V
	Ripple Current	<3%	<3%	<3%	<3%
	Uout Max.	80V	80V	80V	80V
	Turn-on Time	<0.5s	<0.5s	<0.5s	<0.5s
	Dimming Interface	DALI, Switch-Dim	DALI, Switch-Dim, 1-10V		
Environment	Operation Temp.	-20~+45℃	-20~+45℃	-20~+45℃	-20~+45℃
	Case Temp. (Max.)	75℃	80℃	80℃	80℃
	IP Rating	IP20	IP20	IP20	IP20
Safety and EMC	EMC Standard	EN55015, EN61547, EN61000-3-2, EN61000-3-3			
	Safety Standard	EN61347-1,EN62493,EN61347-2-13			
	DALI Standard	IEC62386-101 ; IEC62386-102 ; IEC62386-207			
	Certifications	Semko, CB, RCM, CE , EMC			

Dimensions and Terminals

Model: HED2020 1x20W

N
L
Switch
DALI
DALI

LED Current & Voltage Selection

+ LED
− LED

52
150
28
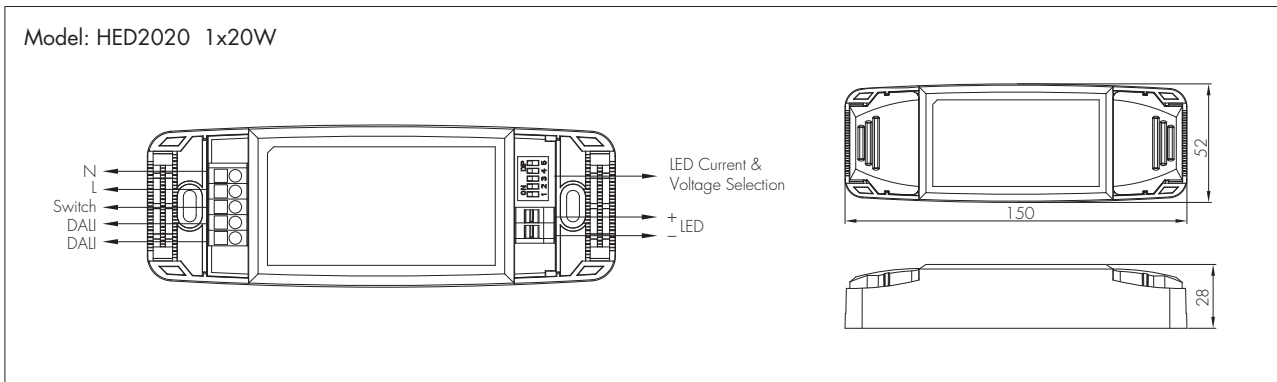
Model: HED2040 1x40W / HED2050 1X50W

LED Current Selection
LED
1-10V
DALI
Switch-Dim
N
L

4.5
67
79.2
111
123.2
30

Model: HED2060 1x60W

L
N
Switch-Dim
DALI
DALI

LED+
LED-
LED Current Selection

40
42
4.1
58
192.4
220

Wire Preparation

0.75 - 1.5mm²

8mm
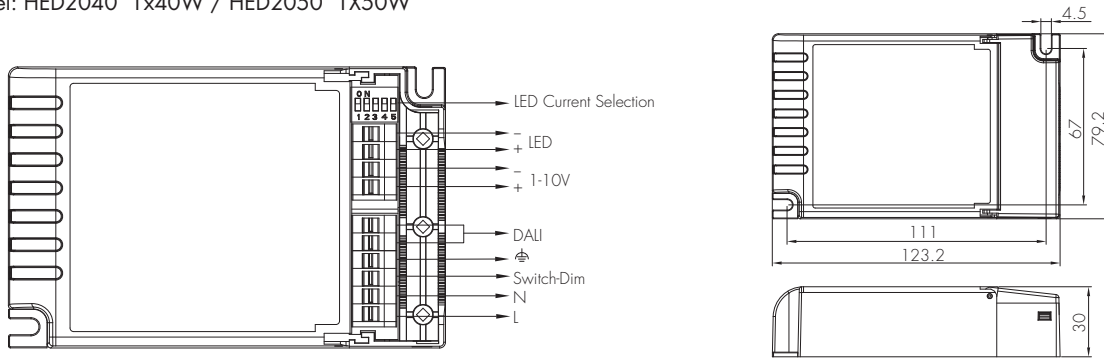
To make or release the wire from the terminal, use a screwdriver to push down the button.

1.5 - 3mm²

8mm

LED output HED2060 only.

Loading and In-rush Current

Model	HED2020	HED2040	HED2050	HED2060
In-rush Current (Imax.)	1.92 A	5.35 A	5.1 A	4.8 A
Pulse Time	60 µs	60 µs	60 µs	30 µs

Number of Drivers Based upon 16A Circuit Breaker

Cct Breaker Type	HED2020	HED2040	HED2050	HED2060
Type B	65	30	30	27

Conversion table for max. quantities of drivers on other types of Miniature Circuit Breaker

MCB Type	Rating	Relative number of drivers	MCB Type	Rating	Relative number of drivers
B	16A	100% (see table above)	C	10A	104%
B	10A	63%	C	13A	135%
B	13A	81%	C	16A	170%
B	20A	125%	C	20A	208%
B	25A	156%	C	25A	260%

* Environmental factors (such as temperature) will also influence the maximum number of the drivers. Please refer to the MCB manufactures datasheet for loading and derating factors.
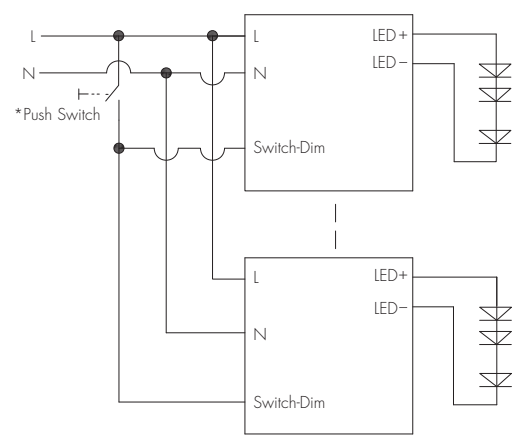
Wiring Diagrams

DALI Connections
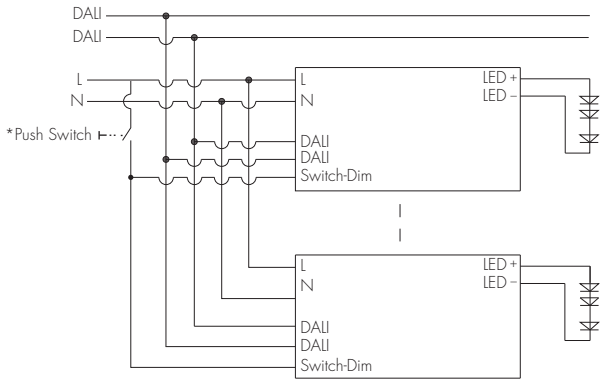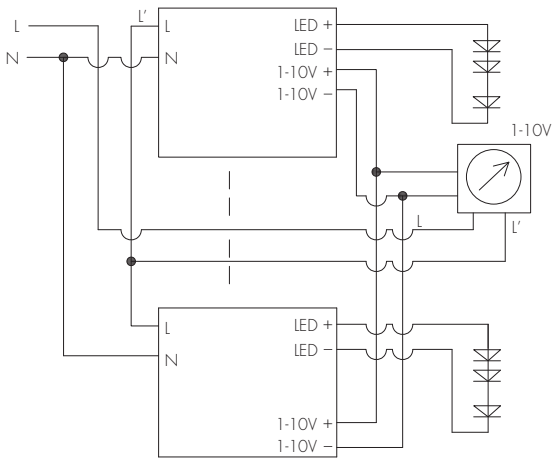

* Optional Switch-Dim for manual over-ride of DALI, check compatibility as the DALI system may periodically over-ride.
* 1-10V is disabled upon DALI connection.
* Unused terminals have been omitted for clarity.

Switch-Dim Connections
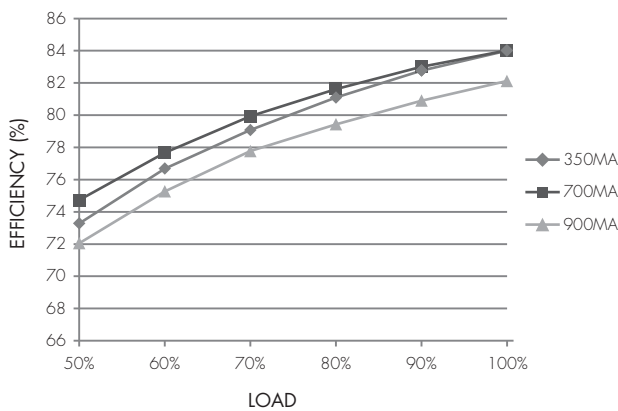

* Unused terminals have been omitted for clarity.
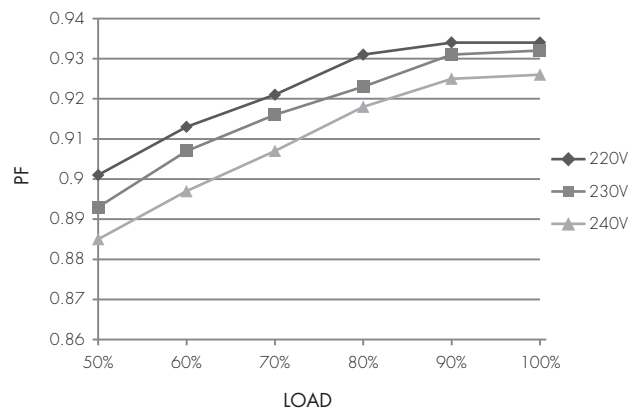
1-10V Connections

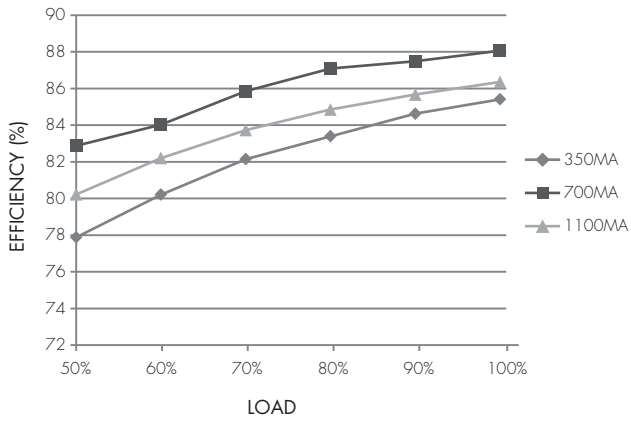* Unused terminals have been omitted for clarity.

Performance Characteristics

HED2020

* Typical Efficiency vs Load

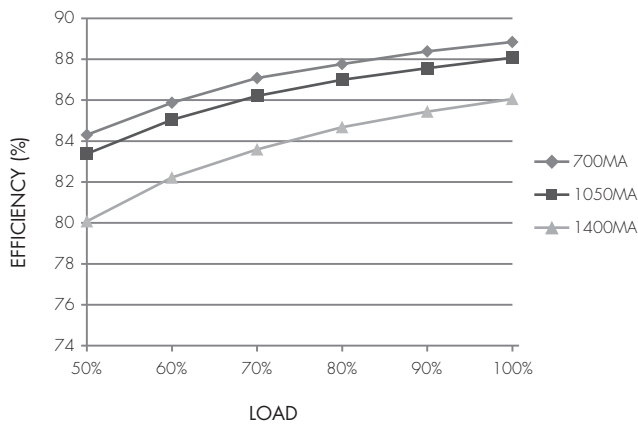* Typical Power Factor vs Load

HED2040
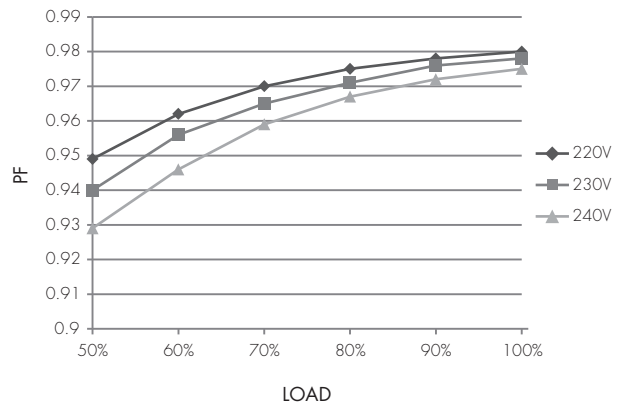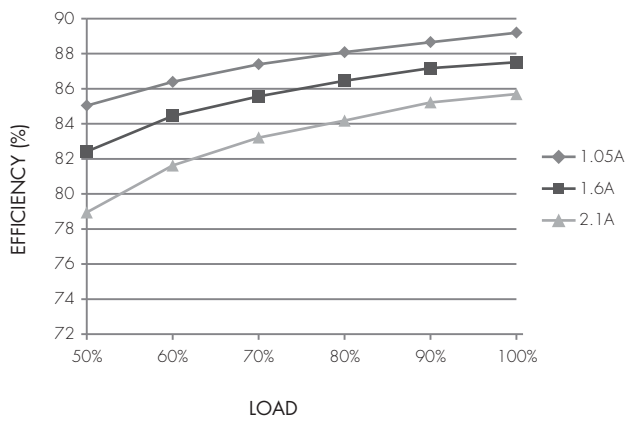

* Typical Efficiency vs Load
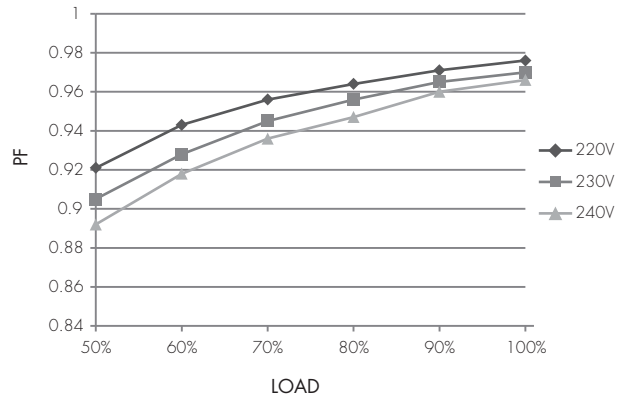
* Typical Power Factor vs Load

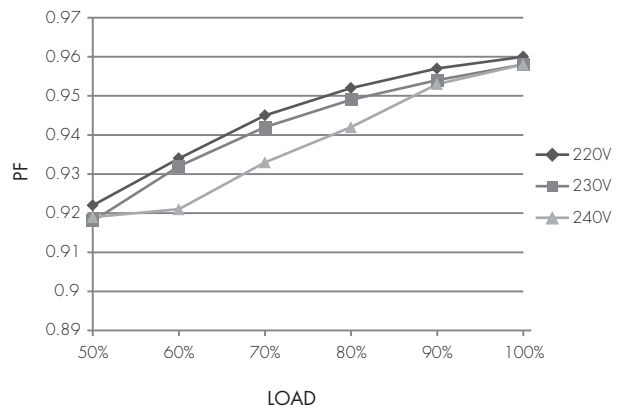**HED2050**

* Typical Efficiency vs Load

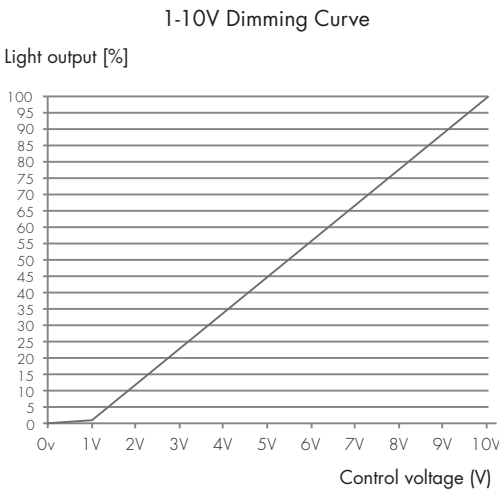* Typical Power Factor vs Load
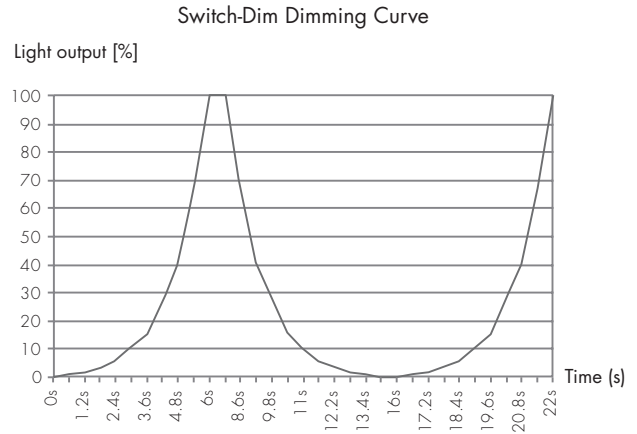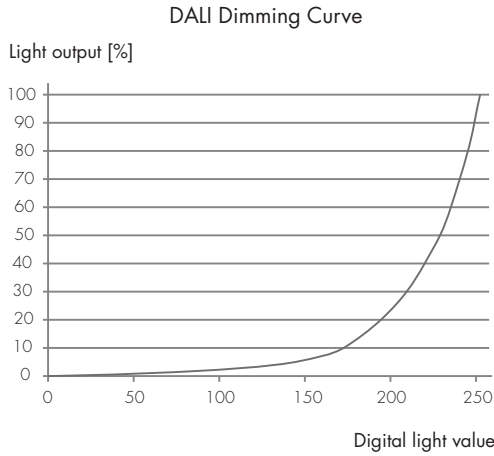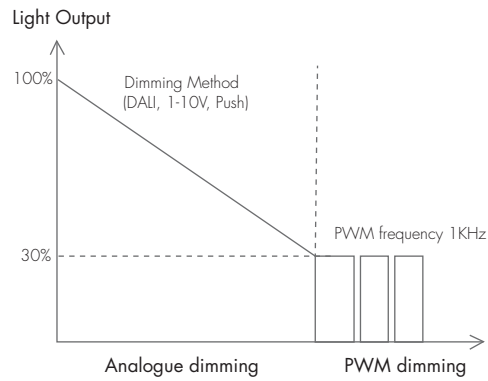
HED2060

* Typical Efficiency vs Load

* Typical Power Factor vs Load

Dimming Characteristics

DALI Dimming Curve

Light output [%]

Digital light value

Switch-Dim Dimming Curve

Light output [%]

Time (s)

1-10V Dimming Curve

Light output [%]

Control voltage (V)

Dimming Profile

Light Output

Dimming Method
(DALI, 1-10V, Push)

100%

30%

PWM frequency 1KHz

Analogue dimming   PWM dimming

Dimming range	Dimming technique
30%-100%	Analogue
1-30%	PWM

Note：An upgrade with extended flicker-free dimming is in development
to provide 3-100% analogue dimming.
Please check our website for announcements…

Dimming Interface Operation Notes

DALI

This series of products are supplied as DALI default group 0 and are 'plug n'play DALI' or 'independent DALI' system ready.
These models are also fully DALI addressable and may be assigned to groups within the limits specified by the DALI protocol or supporting DALI controllers by using a DALI programming tool. The standard DALI commands set for light output control are covered by these models. They do not, however, return any request for extended features (such as fault feedback) to the DALI master. Please see our DALI 2 series for LED drivers which can be used in this specification of DALI system.

1-10V (HED2040 / HED2050 only)

The 1-10V input is operable via commercially available simple rotary wall switches designed for 1-10V dimming equipment or from dedicated system central dimming controllers.
Note: In the unlikely event that the LED driver be used with the Switch-Dim or DALI interface prior to using the 1-10V interface, the 1-10V interface may need to be re-set. This is achieved by placing a short circuit across the 1-10V terminals until the light returns to full brightness (approx. 3-5 seconds).

Switch-Dim

The provided Switch-Dim interface allows for a simple dimming method using commercially available non-latching (momentary) wall switches. Up to 64 LED drivers maybe connected to one switch. The Switch-Dim interface may also be used at the same time as DALI to serve as a manual over-ride.

Switch Action	Response
Short press (<0.4 second)	Toggle light on / off
Note: short press has to be longer than 0.1s, or it will be invalid.	
Long press (>0.4 second)	Toggle dim light / increase brightness

Synchronization

Switch Action	Response
Long press (>15 seconds)	All lights will dim down to minimum then return to 50% brightness

* We recommend the number of drivers connected to a switch does not exceed 25 pieces. The maximum length of the wires from push to driver should be no more than 20 meters.