

Constant current independent dimmable driver
MCL(S) Series suffix MN(0/1-10V/10V PWM/Rx dimming+NFC programmable)



Features

- Support 0/1-10V/10V PWM/Rx dimming mode
- **Slim shape design, can be installed through a 35mm mounting hole**
- The output current programming can be realized through the NFC interface
- Soft dimming and flicker-free at any brightness
- Using HPC patented technology, at any dimming level, the brightness of the lights is the same
- Standby power input<0.5W, meets the requirements of ErP certification
- High PF, high efficiency, low THD
- Screw-free and pressing type strain relief and easier to install
- Intelligent LED hot-plug protection function
- SELV and Class II design, suitable for use outside of the luminaires
- Compliance with Zhaga Book 24/25 standards
- Compliance with CE,ENEC,UKCA,RCM,EL and other certifications
- IP20 protection grade, indoor use
- Nominal life-time up to 100,000 h
- 5.5-year guarantee

Interfaces

- 1-10V(0/1-10V/10V PWM/Rx)

Functions

- Support central emergency application
- Support self-contained emergency application
- Programming via NFC(EasySet)(Programmable 0-10V)
- Protective features
(short-circuit,no-load,overload,over temperature,
hot plug-in protection)

Suitable for lights

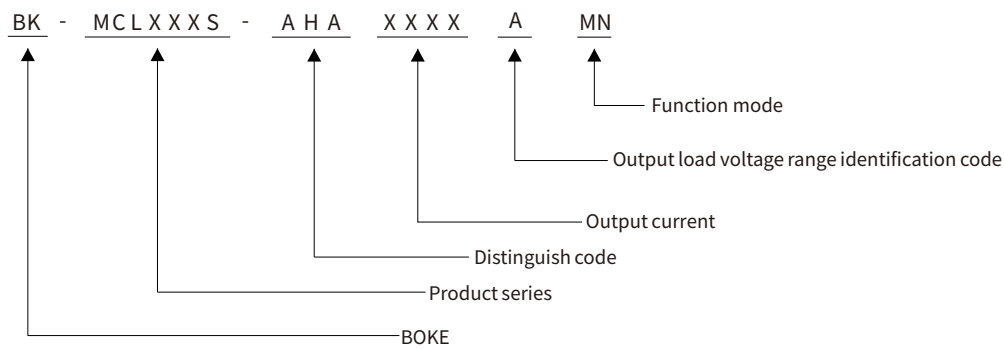
- Suitable for downlights or spotlights with **small mounting holes**

Typical applications

- LED indoor lighting
- LED office lighting
- LED commercial lighting



Model coding rules of MCL(S) series



Function list

Model	Suffix	Wired dimming	Advanced functions	Device Configuration
		0/1-10V	AOC	NFC interfaces
BK-MCL015S-AHA	MN	√	√	√

Model list

Model	Input voltage	Output power	Output voltage	Output current	Dimension
BK-MCL015S-AHA0700AMN	200-240VAC/DC	15W MAX.	2.5-42VDC	0.1-0.7A	L129*W29.5*H20mm

Technical data

Product model	BK-MCL015S-AHA0700AMN
Output parameters	
Regulation method	Constant Current
Rated output current range	0.1-0.7A, see the operating window for details
Rated output voltage range	2.5-42VDC, see the operating window for details
Rated output power	15W Max, see the operating window for details
Output current adjustment	EasySet Programming
Output current ripple(typ.)	±3%(100kHz)
Output current accuracy	±5%
Linear regulation	±3%
Load regulation	±5%
No load output voltage	59VDC
Flicker-free(typ.)	Flickering percent(IEEE 1789)=0.359%(100Hz), Flicker index(IEEE 1789)=0.000(100Hz), Pst LM = 0.001, SVM = 0.004, (The above parameters are obtained from testing the panel lights)
Input parameters	
Rated input voltage range	200-240VAC 200-240VDC
Input voltage range	180-264VAC 180-264VDC
Input voltage shock	<380 V AC
Input current	<0.1A (Rated input voltage)
Input frequency	0/50/60Hz
Input PF/Input DF(typ.)	PF: 0.97, DF:0.97 , see the electrical values below for details
Input THD(typ.)	9% , see the electrical values below for details
Efficiency(typ.)	86% , see the electrical values below for details
In-rush current(typ.)	0.65A peak ,50us duration(50 % Ipeak), see the description below for details
Start/Switchover/Turn off	<0.5s(AC start), <0.5s(DC start), <0.3s(AC/DC switchover), <0.5s(Turn off)
Switching cycles	> 100,000 switching cycles
Power consumption(typ.)	Full load(Pin):17.4W, No load(Pno):N/A, On stand-by(Psb) : <0.5W, Network stand-by(Pnet) : N/A
Safety	
Withstand voltage	I/P-O/P(LED):3750V AC(LED, DIM port must be short-circuited), O/P(LED)-O/P(DIM):1500V AC, I/P-O/P(DIM):1500V AC
Mains surge capability	L-N:2KV(90°/270°, 5 times each with an interval of 60s)(Performance criterion:A)
Leakage current(typ.)	0.6mA
Isolation resistance	I/P-O/P:100MΩ/500Vdc/25°C/70%RH
Control interface	
DALI dimming port	N/A
pushDIM dimming port	N/A
3in1 dimming port	Voltage range: DC 0/1-10V, interface current consumption: <1mA
Auxiliary power supply	N/A
Dimming range	0.1-100%(minimum current:0.7mA)
Dimming drive mode	AM(amplitude modulation)
Emergency support	
Central emergency system	Supported
Self-contained emergency	Supported
Environment & Life time	
Operating temperature	Ta=-20-45/50/60°C, see the operating temperature for details
Case temperature	Tc=85°C
Operating humidity	5-85% RH, non-condensing
Storage temp./humidity	-40-80°C, 5-85% RH, non-condensing
IP grade	IP20
MTBF	500,000H, MIL-HDBK-217F(25°C)
Life-time	Nominal life-time up to 100,000 h, see the description below for details
Vibration resistant	10~500Hz, 5G 12min./1cycle, period for 72min. each along X,Y,Z axes
Acoustic Noise	<25dB(30cm, Normal operation)
Environmental protection	RoHS
Certifications and standards	
Certification	CE, ENEC, UKCA, RCM, CCC, EL
Safety	GB/T 19510.1, GB/T 19510.213, EN61347-1, EN61347-2-13, EN62384
EMC	GB/T 17743, GB17625.1, EN55015, EN61000-3-2, EN61000-3-3, EN61000-4-2, 3, 4, 5, 6, 8, 11, EN61547
DALI-2	N/A
EL	Compatible IEC 61347-2- 13 Annex J, compatible with EN 60598-2-22 and EN 50172
RF	N/A

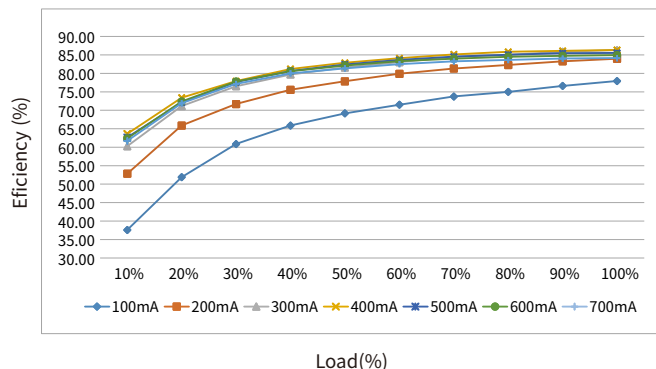
Remarks

- 1.By default, all parameter are measured at 230VAC input, 50Hz, full load and 25°C of ambient temperature.
- 2.The driver can not be installed inside the light. when the driver is used with the light, the EMC of the whole light needs to be tested.

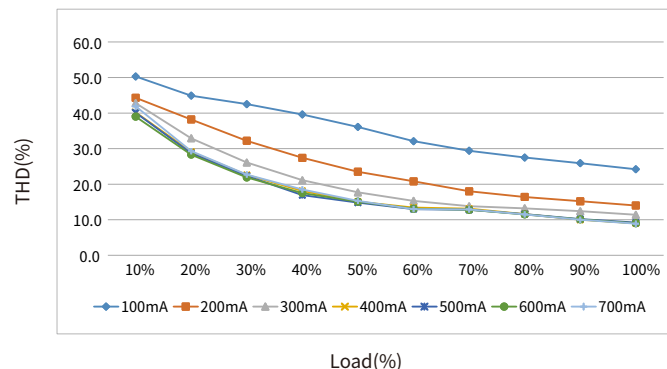
Electrical values

BK-MCL015S-AHA0700AMN

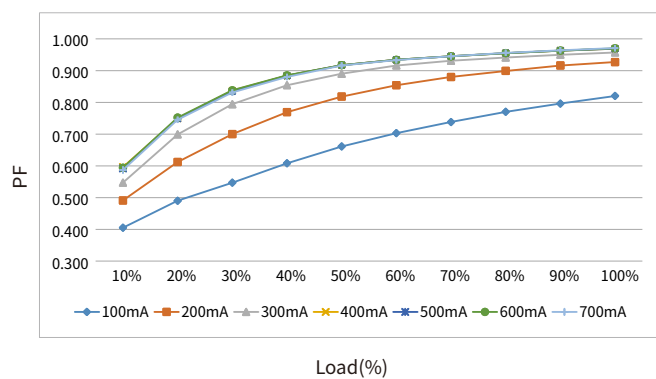
Efficiency vs load



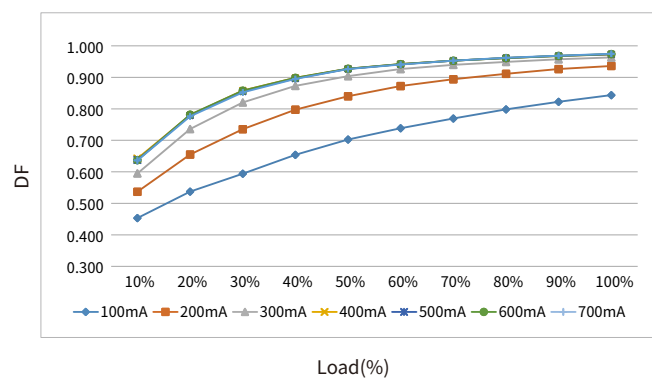
THD vs. Load



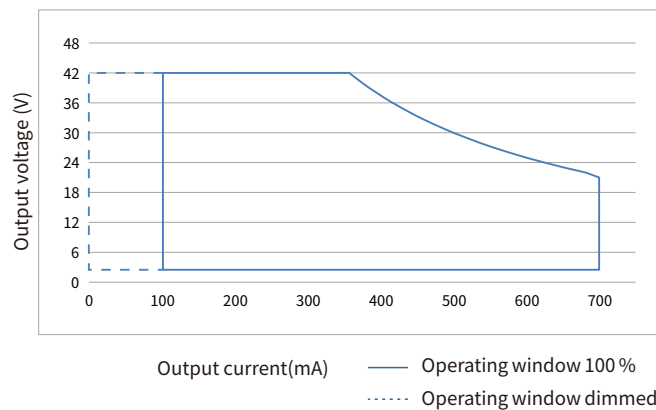
Power factor vs. Load



Displacement factor vs. Load



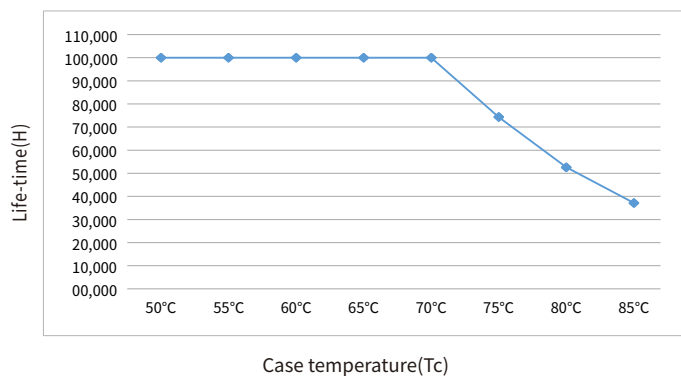
Operating window



- Output voltage x output current = output power
- The minimum current step is 1mA, the minimum voltage step is 1V, the voltage range is 2.5-42V, the current range is 100-700mA, and the voltage and current can be set arbitrarily under the premise that the output power does not exceed 15W.

Expected life-time

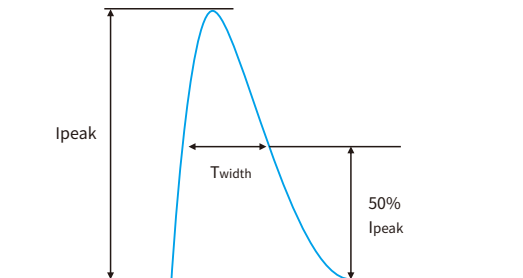
Life-time vs. case temperature



- The life-time of the LED driver is shown in the figure above (calculated based on the 90% survival rate).
- The relation of tc to ta temperature depends also on the luminaire design.

Surge

Model	Ipeak	Twidth	Condition	Relative number of MCB/pcs														
				B10	B13	B16	B20	B25	C10	C13	C16	C20	C25	D10	D13	D16	D20	D25
BK-MCL015S-AHA	0.65A	50us	AC 230V,Full load, Cold start,Ta≤30°C, MCB is not installed side by side	103	133	164	205	256	103	133	164	205	256	103	133	164	205	256



Remarks

- The number of drives mounted under different MCBs in the table is the maximum value. Please do not exceed this number during installation.
- Calculation uses typical values from ABB series S200 as a reference.
- Different brands and models of miniature circuit breakers, the number of drives mounted will be slightly different.
- If the ambient temperature of the MCB installation exceeds 30°C or multiple MCBs are installed side by side, the number of drives mounted will be reduced and the calculation needs to be recalculated.
- Electrician's usually consider Type B for household lighting and Type C for commercial lighting application.

Functions

Output hot plug-in protection

- This function is used to prevent LED light that are far below the driver's no-load voltage burnout when hot plugged into a powered driver output.
- This function can be enabled or disabled through the programming interface.
If enabled, when the LED light is connected to the powered driver, the LED light will not light up, you can restart the drive to restore normal.
If disabled, when the LED light is connected to the powered driver, the LED light will turn on or off according to the current brightness level.
- Please refer to the parameters configure in the "Device configuration" section for information on whether the default factory settings are enabled.
- Factory default Enabled or not please check the "Device configuration" section .

- Note:

When the hot plug-in protection is enable, the following applications may not achieve the expected effect:

1. When the output of the driver is connected to the color temperature switch:
When the switch is used to change the color temperature, the hot plug-in protection of the driver will be triggered, and the LED will not be lit.
2. When the LED driver is used in conjunction with a self-contained (independent) emergency control device:
Use the self-check test switch of the emergency control device to test the emergency function and when exiting the emergency mode, the driver's hot plug-in protection will be triggered and the LED will not be lit.

The above two application drivers should turn off the hot plug-in protection function in order to achieve good working results.

Output short-circuit behaviour

- Output short-circuit will not damage the driver.
After removing the short circuit fault, the driver will automatically resume output.

Output no-load operation

- Output no-load will not damage the driver.
Please turn off the driver first if you need to connect the LED load.

Output overload protection

- The LED driver turns off the output if the output voltage range is exceeded.
The output will be activated again after restart the LED driver .

Output over temperature

- When the operating temperature exceeds the set over temperature protection value of the internal circuit of the power supply, the power supply enters protection states such as output derating, output hiccup or output shutdown. After the external temperature is normal, restart and resume operation.

Driver restart method

There are two ways to restart the driver:

- Through the AC input: disconnect the AC of the driver and power it again.
- Through dimming interface.
1-10V: first adjust the output voltage of the dimmer to 0.9V or below, then adjust it to 1V or above.

Adjustable output current (AOC)

- The output current of the driver can be adjusted within a certain range, can be selected through the EasySet configuration software.

Configuration programming(EasySet)

- The programming configuration of the driver is realized using the BOKE EasySet programming suite and through the driver's NFC interface.
- Please see the "Device configuration" section.
- More information about the EasySet programming suite can be found at www.bokedriver.com.

Insulation between circuits

Isolation	Input	Output	Case	DIM
Input	-	Double	Double	Double
Output	Double	-	Basic	-
Case	Double	Basic	-	Basic

Label

BK-MCL015S-AHA0700AMN


Dimmable Constant Current LED Driver
 (LED控制装置)
 www.bokedriver.com
 MODEL(型号): BK-MCL015S-AHA0700AMN
 Input(输入): 200-240V $\approx$ 0/50/60Hz • t_c : 85°C
 0.1A Max. λ : 0.4C-0.95
 Output(输出): 2.5-42V $\approx$ 100-700mA 15W Max. 59VDC Max.
 For LED Modules use only MADE IN CHINA(中国制造)

Ta	Po(W)	Io(mA)
45°C	≤ 15	≤ 700
50°C	≤ 12	≤ 700
60°C	≤ 10	≤ 500

SELV
 LED+ ■
 LED- ■
 DIM+ ■
 DIM- ■
 wire prep.
 0.5-1.0mm²

■ ACN/DC-
 ■ ACL/DC+
 Preparation for input and output
 8-9mm


 25
 0/1...10VDC
 PWM signal
 R0...100K Ω

EasySet area
 wire prep.
 0.5-1.0mm²




For Australia and New Zealand, the marking label with "EasySet" and "EL" is required.

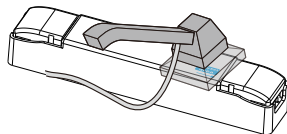
Address: 2nd and 3rd Floor, No. 51, Xihuan 5th Road, South District, 528455 Zhongshan City, Guangdong, CHINA

Laser engraving technique

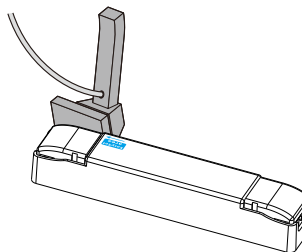
Operating temperature & output current

Tc	Ta	Po(W)	Io(mA)
85°C	45°C	≤ 15	≤ 700
	50°C	≤ 12	≤ 700
	60°C	≤ 10	≤ 500

NFC scanning area



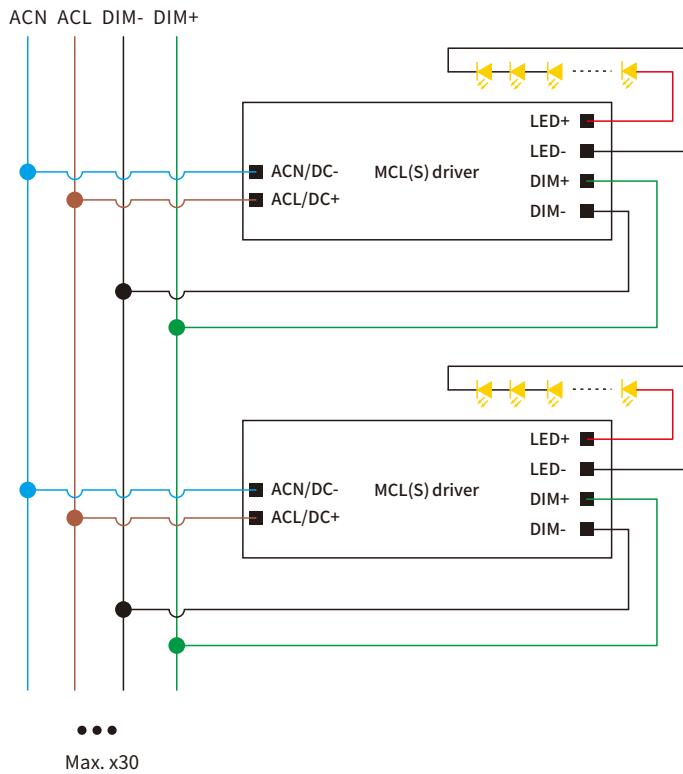
✗ Error scanning mode



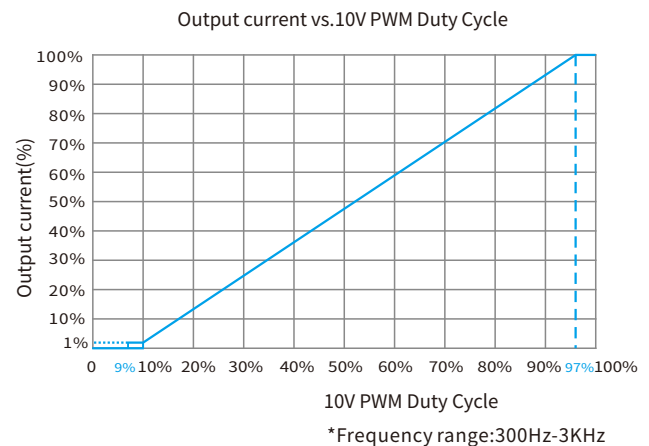
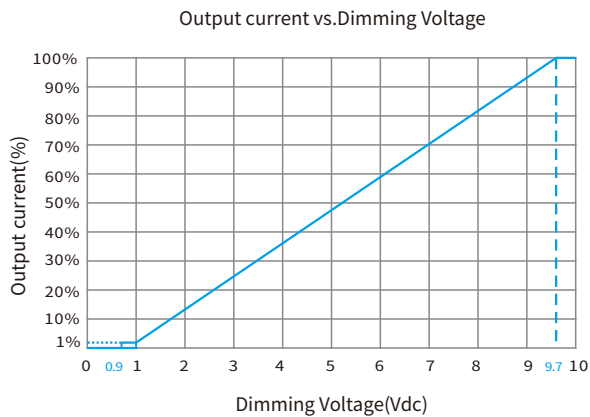
✓ Correct scanning mode

1-10V dimming application

Wiring diagram

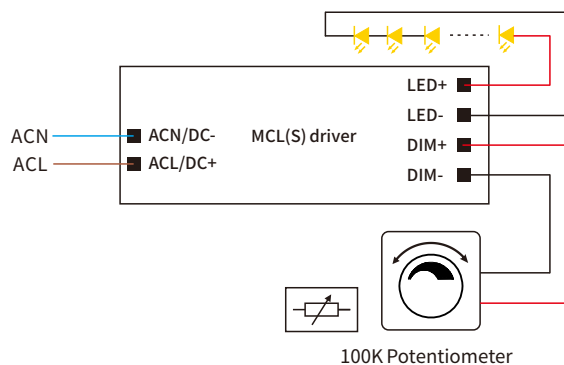


Dimming curve



100K potentiometer dimming application

Wiring diagram



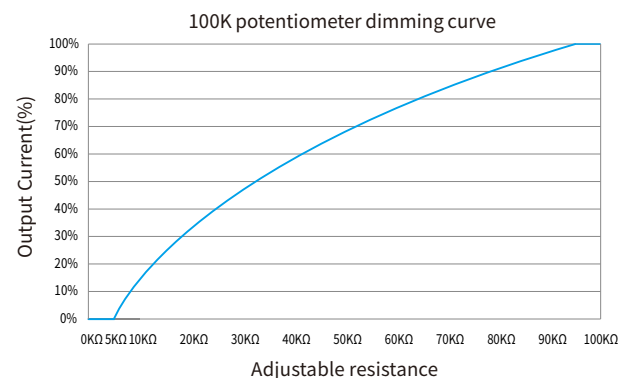
Remarks

- In the 100K potentiometer dimming mode, the potentiometer can only be connected to one driver.

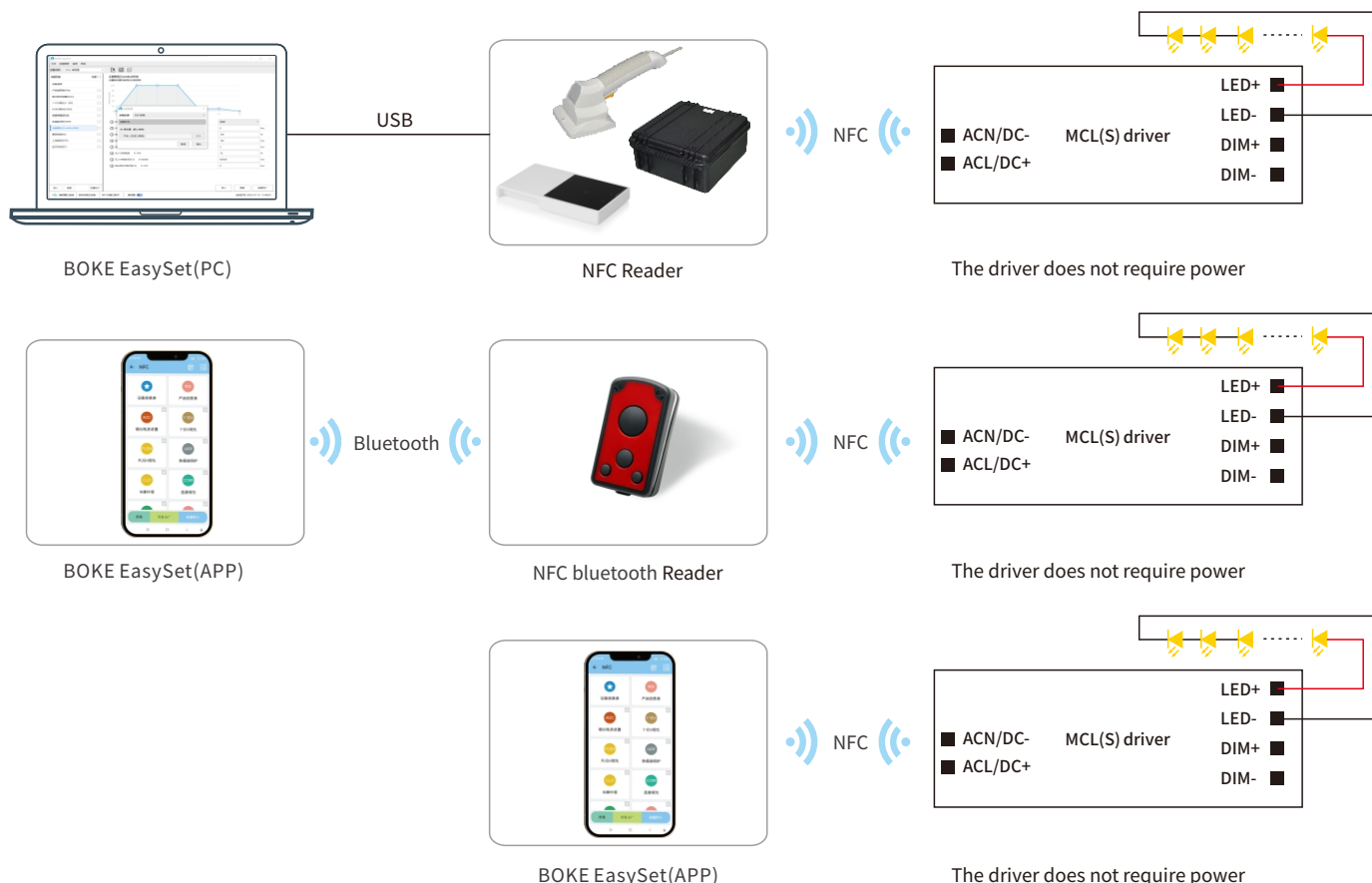
Remarks

- Dimming interface characteristics: 0.9V and below are closed, 1V is the darkest, 10V is the brightest, 1-10V is the dimming range.
- The dimming interface distinguishes between positive and negative, DIM+ is positive, DIM- is negative, please do not reverse.
- Dimming interface does not support voltage access higher than 15V, otherwise it will cause damage to the internal components.
- When the dimming interface is open, the driver outputs the maximum current. When the interface is short-circuited, the current output is closed.
- When multiple synchronous dimming is required, the positive poles of the dimming interface of each driver are connected together, and the negative poles are connected together.
- Support passive dimmer or isolated active dimmer dimming, does not support non-isolated active dimmer dimming.
- In general, it is recommended that the number of mounted drives does not exceed 30pcs, and the wiring length does not exceed 100m.
- It is recommended that the dimming wires should not be lower than the 22AWG wire.
- Do not put the dimming wires with high voltage or interference sources. If it is unavoidable, please use the shielded wires.
- If you need a drive with 0-10V dimming characteristics, please contact BOKE.

Dimming curve



Device configuration



Software download(PC&mobile)



PC:Windows7/Windows10/Windows1132bit/64bit;
Mobile:Androidsystem≥6.0, iossystem≥14.0.

Configure tools and software

Type	Name	Brand	Name	BOKE EasySet minimum version(PC)	BOKE EasySet minimum version(APP)
Programmer	NFC desktop Reader	FEIG	CPR30+	V1.0.0	-
	NFC handheld Reader	FEIG	ID ISC-PRH101-USB	V1.2.2	-
	NFC Bluetooth Reader	FEIG	ID ECCO Smart HF-BLE	-	V1.0.0
	NFC batch Reader Kit	FEIG	RF-LRM1002-300/300 Kit	V1.3.4	-
Software	PC Software	BOKE	BOKE EasySet	V1.0.0	-
	APP	BOKE	BOKE EasySet	-	V1.0.0

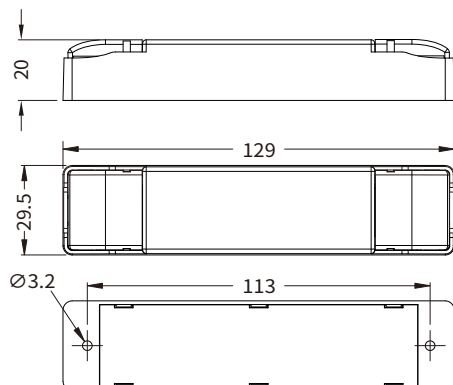
Parameters configure

Configuration items	Factory settings	Parameter configuration	Read/Wirte
Product information	-	NO	Read Only
Adjustable output current(AOC)	Activated	YES	Read/Wirte
1-10V dimming(0/1-10V)	0.93-9.7V(1-10V)	0.3-9.7V(0-10V)	Read/Wirte
Hot plug-in protection(HPP)	Deactivated	YES	Read/Wirte
Run-time(RT)		NO	Read Only
Other parameters		YES	

Mechanical Specification

Size(Unit:mm)

MCL015S



INPUT

Numbering	function	colour
1	ACN/DC-	grey
2	ACL/DC+	grey

Input wire

Built-in:0.5-1.5mm²
Independent:0.75-1.5mm²

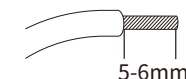


OUTPUT

Numbering	function	colour
1	LED+	red
2	LED-	black
3	DIM+	red
4	DIM-	black

Output wire

0.5-1.0mm²



Installation note

Hot plug-in

- Hot plug-in is not supported due to residual output voltage of > 0 V.
- If a LED load is connected the device has to be restarted.
- Restart can be achieved by re-powering the driver or executing a on/off command (action) through the control interface.

Installation requirements

- The driver should be installed in a dry, acid-free, oil-free, fat-free environment.
- The installation ambient temperature of the driver shall not exceed the value of Ta at any time.
- The temperature of the mounting surface of the driver should be lower than the temperature of Ta.
- The driver should keep a certain distance from the heating stuff (such as the lamp radiator).
- If the driver is used externally (it needs to be used with the power end cover), the installation of the driver should also meet the following conditions:
 - 1.The driver should be a certain distance between the drives, as shown in Figure 1.
 - 2.The driver keeps a certain distance from surrounding objects, as shown in Figure 2.

Wiring guidelines

- All connections must be kept as short as possible to ensure good EMI behaviour.
- Mains leads should be kept apart from LED Driver and other leads (ideally 5-10 cm distance).
- Max. length of output wires is 2m.
- Incorrect wiring can damage LED modules.

Replace LED module

1. Mains off
2. Wait more than 5 seconds
3. Remove LED module
4. Connect LED module again

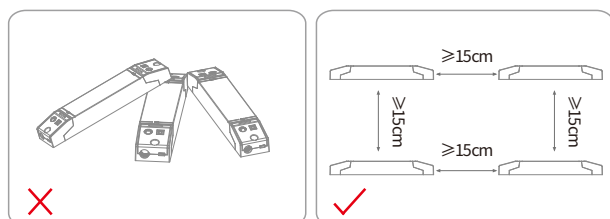


Figure 1

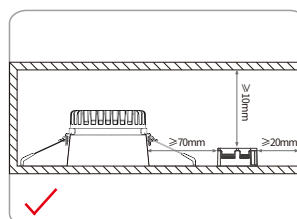


Figure 2

Packaging



Model	Product size	Weight	Box size	Carton size	Qty/carton	N.W	G.W
MCL015S-AHA	L129*W29.5*H20mm	65g	L217*W133*H67mm	L285*W235*H220mm	120pcs	7.8KG	9.2KG

Additional information

1. The life and MTBF of the product are for reference only, and do not represent a warranty statement.
2. For more information, please send an email to info@bokedriver.com.