

Specification of GPRS wireless single light controller

Version: NEMA interface **wireless single light controller specification_V1.2**

Date: 2021-1

1 Introduction

The NEMA interface wireless single light controller is designed for road and area lighting in smart cities. It has the functions of switching, dimming and monitoring lamps; GPS positioning function; environmental illumination detection, whether the street lamp is tilted, etc.

1.1 Safety Instructions

The following safety principles are followed to ensure personal safety and to help protect the product and work environment from potential damage.



When in an airport or other places, it is necessary to prevent the terminal from causing interference to the aircraft communication system. Ignoring this prompt may lead to flight safety issues and even violations of the law.



When in a hospital or health care places, user need to pay attention to whether there are restrictions on the use of terminal equipment. RF interference can cause the medical device to malfunction, so it may be necessary to turn off the terminal device.



The terminal device does not guarantee an effective connection under any circumstances, and it is necessary to ensure that the device is powered on and in an area with sufficient signal strength.



Terminal device will receive and transmit RF signals when it is turned on. Radio frequency interference occurs when you are near a radio or other electronic device.



Keep the device away from flammable gases. Do not put it near gas stations, oil depots, chemical plants or explosive work site. There are hidden dangers in operating electronic equipment in any potentially explosive atmosphere.

2 Features

2.1 Main Features

Features	Description
Supply power	Wide voltage input design: can work at 100-264VAC Surge protection: 4KV, 4KA
Save power	Working power consumption: <2W Power off consumption: <0.4W (120V); <0.5W (230V)
Working temperature	-40~70°C
GPRS module	Working in 850/900/1800/1900MHz quad-band ISM frequency band; Comply with IEEE802.15.4 standard; AES128 encryption
GPRS data characteristics	In Single Tone mode: Data downlink transmission: 85.6kbps Data uplink transmission: 85.6kbps In Multi Tone mode: Data downlink transmission: 85.6kbps Data uplink transmission: 85.6bps Support IPv4, IPv6, UDP, CoAP, PPP, SMTP, DTLS, TCP and other protocol stacks
Driving power	Supports up to 1000W LED driver
Dimming interface	Equipped with 1 channel 0~10V dimming interface (analog), one channel PWM
Self-information monitoring	Monitor the lamp input voltage, current, power, power factor and Temperature. Statistical energy consumption and working hours
location	GPS accuracy ±6M (without obstruction to the air)
Light control	Meets ANSI C136.10 standard (only in offline mode, Optional)
Dimming	Strategic dimming Group dimming The lamps still work according to the set dimming schedule and illuminance even when communication fails
protection	Over voltage, over current, short circuit protection
Warranty	5 years

3 Specification

3.1 Absolute Maximum Range

PARAMETER 参数	TEST CONDITIONS 测试环境	MIN 最小	TYP 典型	MAX 最大	UNIT 单位
Min input voltage 最小输入电压		100	/	/	VAC
Max input voltage 最大输入电压		/	/	264	VAC
Max output current 最大输出电流	Peak@100mS 峰值，100ms	/	/	5	A
Max dimming current 最大调光电流	RMS 平均值	/	/	10	mA

3.2 Electrical Specification

At 220VAC input, 20°C, 50% humidity, 100Kpa atmospheric pressure.

PARAMETER 参数	TEST CONDITIONS 测试环境	MIN 最小	TYP 典型	MAX 最大	UNIT 单位
AC input voltage 交流输入电压		100	/	264	VAC
AC input current 交流输入电流	220VAC	0.02	/	5	A
AC output current 交流输入电流	220VAC, RMS 平均值	0	/	5	A
Power Dissipation 自身功耗		0.4	/	2	W
Dimming voltage 调光电压		0	/	10	V
Dimming current 调光输出电流	10Voutput	0	1	10	mA
Dimming accuracy 调光精度		-1	/	+1	%

Metering voltage range 计量电压输入范围		0	/	300	VAC
Metering current range 计量电流输入范围		0	/	20	A
Metering voltage accuracy 计量电压精度		-2	/	+2	%
Metering current accuracy 计量电流精度		-2	/	+2	%
RF transmission distance 射频传输距离	3dBi antenna 使用 3dBi 增益天线	500	/	/	m
RF transmission rate 射频传输速率	Good signal 信号良好	/	250	/	Kbps
RF band 射频频段		850	/	1900	MHz
RF receiver sensitivity 接收灵敏度		-98.8	/	/	dBm
RF transmitter power 发射功率			/	26±2	dBm
Spectral range of sensitivity 光谱灵敏范围	Photocell 光控	/	/	/	nm
GPS Sensitivity GPS 接收灵敏度	Tracking 追踪卫星	/	-160	/	dBm

3.3 Operating Condition

PARAMETER 参数	TEST CONDITIONS 测试环境	MIN 最小	TYP 典型	MAX 最大	UNIT 单位
Operating temperature 工作温度		-40	/	70	℃
Storage temperature 存储温度	Indoor dry, well-ventilated place 室内干燥通风良好处	-40	/	80	℃
Relative humidity 相对湿度	No frost 无霜冻	10	/	95	%
Vibration 机械振动		/	/	10	G
Warranty 保质			5		Years
Ingress protection 防护	Not Installed 未安装时	/	IP53	/	
Packaging Impact 包装防护	Drop 跌落	/	1	/	m
Flammability 阻燃		UL94-V0			

3.4 Safety

TYPE/类型	Test level/测试等级	
Isolation Voltage 隔离电压	AC to Dimming 交流到调光	3kVac, 10mA, 1min
Certification 认证	UL773/EN61010-1/EN61347	

3.5 Electromagnetic Compatibility

TYPE/ 类型	Standard/ 标准	Test level/ 测试等级
Electrostatic discharge immunity 静电放电抗扰度	IEC61000-4-2	Level 4
RFEMS 辐射、射频和电磁场的抗扰度	IEC61000-4-3	Level 2
Electrical fast transient burst immunity 电快速瞬变脉冲群抗扰度	IEC61000-4-4	Level 4
Surge Immunity 浪涌抗扰度	IEC61000-4-5	Level X 4KV, 4KA
Conducted disturbances induced by RF field immunity 射频场感应的传导干扰抗扰性	IEC61000-4-6	Level 2
Power frequency magnetic field immunity 工频磁场抗扰度	IEC61000-4-8	Level 3
Electromagnetic disturbance characteristics 电磁干扰特性认证	FCC PART15 Class B / EN55015	
Electromagnetic compatibility and Radio spectrum Matters (ERM) 电磁兼容性和无线电频谱认证	EN300328/EN301489-1/EN301489-17/EN300440-2/ EN62479/EN61326-2-1	

4 Structural Data

4.1 Size

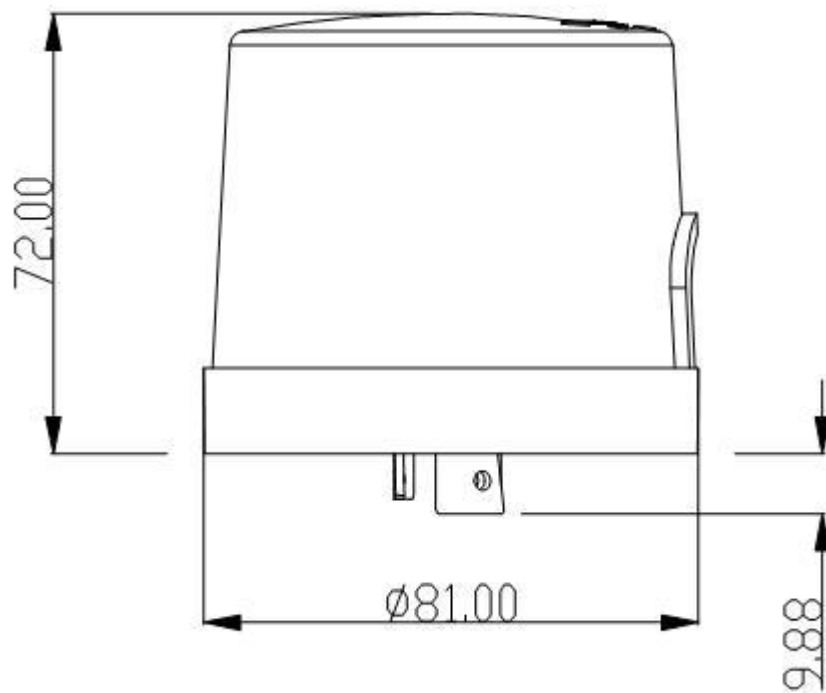


Figure 1: Module side view

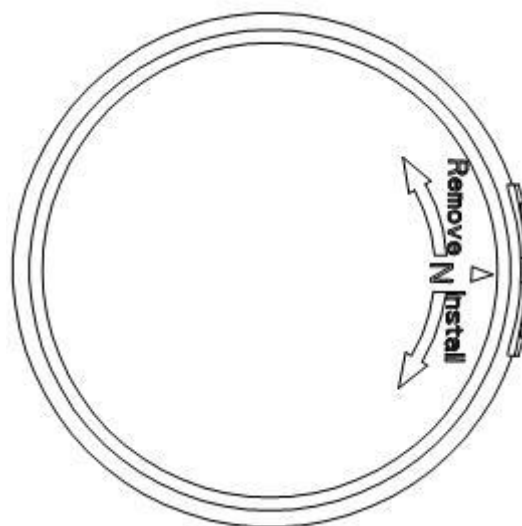


Figure 2: Top view

4.2 Interface

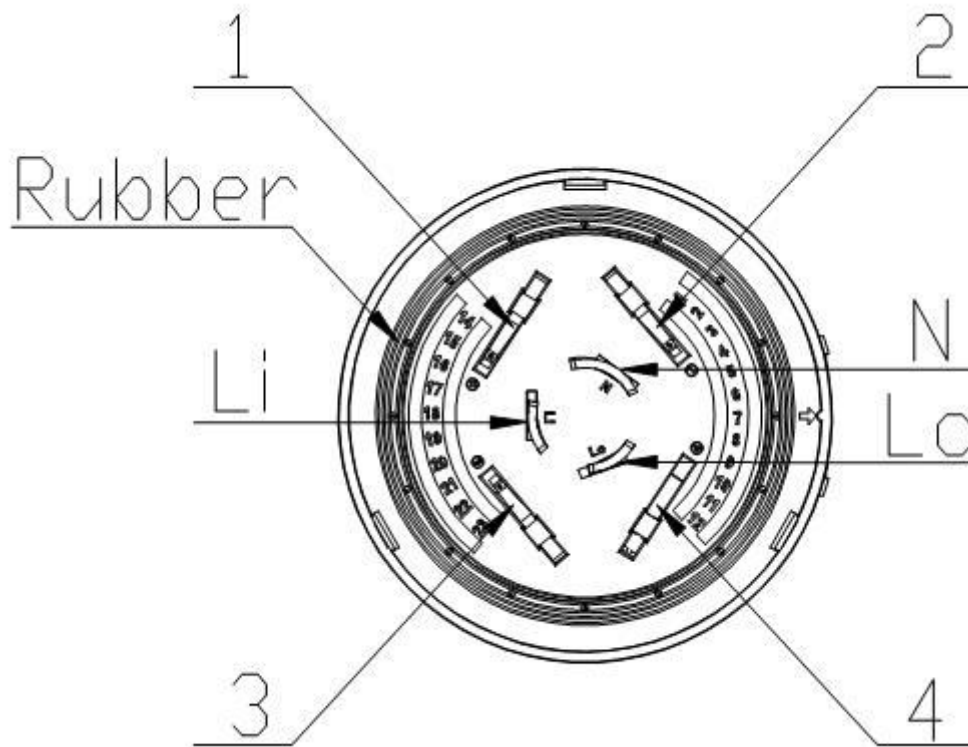


Figure 3: Bottom view

- PIN Li: Live line input/火线输入;
- PIN Lo: Live line output/火线输出;
- PIN N: Neutral line input/零线输入;
- PIN 1: CH1 Dim+/调光通道 1 正;
- PIN 2: CH1 Dim-/调光通道 1 负;
- PIN 3: CH2 Dim+/调光通道 2 正;
- PIN 4: CH2 Dim-/调光通道 2 负;
- The Rubber Ring makes installation ingress protection can reach IP65;
橡胶圈可以使产品安装在底座上后达到 IP65 防护等级。
- Complies with ANSI C136.41-2013. 符合
ANSI C136.41-2013 要求。

5 Part Description

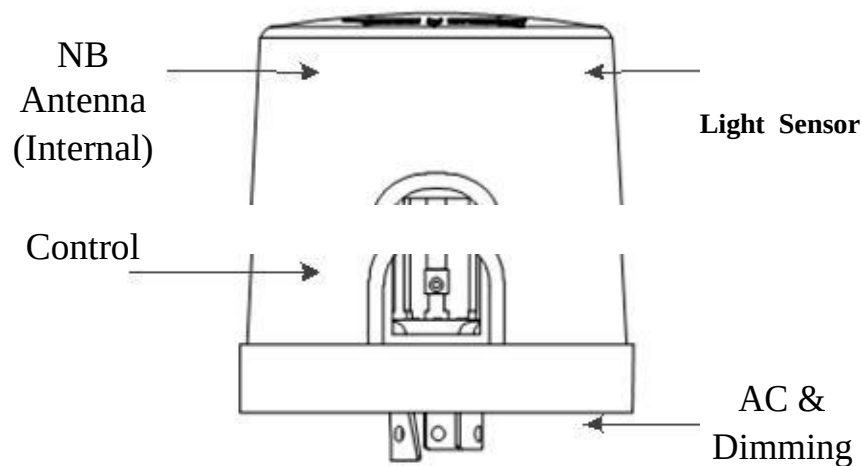


Figure 4: Front view

5.1 GPRS Wireless Module

GPRS module can be used to communicate with the base stations and help to transfer a variety of instructions, such as: switching ON/OFF, dimming commands, uploading power consumption data, uploading illuminance information, etc.

5.2 Control Module

After booting, the module automatically obtains the command sent by the system to start the dimming strategy. If not set, the module will dim according to the factory default strategy.

5.3 Light sensor (optional)

The light sensor uses a digital light sensor. Its sensing range is adapted to the recognition range of the human eye. After the module joins the NB network, it will upload the illuminance data to the gateway. When the module works offline, it will turn on the lights at 16 ± 6 lux and turn off the lights at 50 ± 6 lux (default setting).

5.4 Dimming

The product has 1 channel 0-10V analog dimming interface and one channel PWM interface. To better accommodate the needs of multiple LED drivers, the default dimming curve is shown in Figure 5.

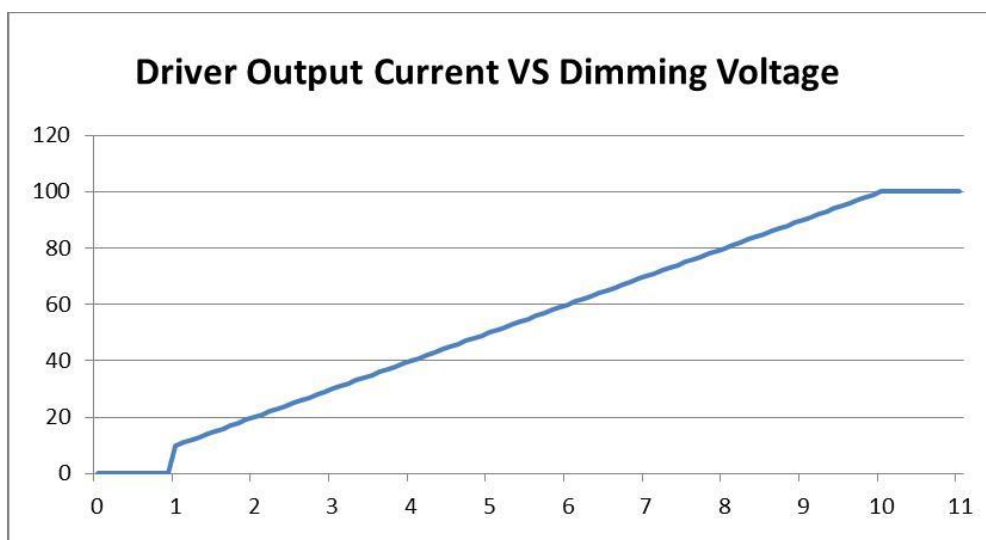


Figure 5: Default dimming curve

6 Application

6.1 Sockets and modules

The module needs to be used with the twist lock light control socket. (According to ANSI C136.41 requirements), the socket is shown in Figure 6.

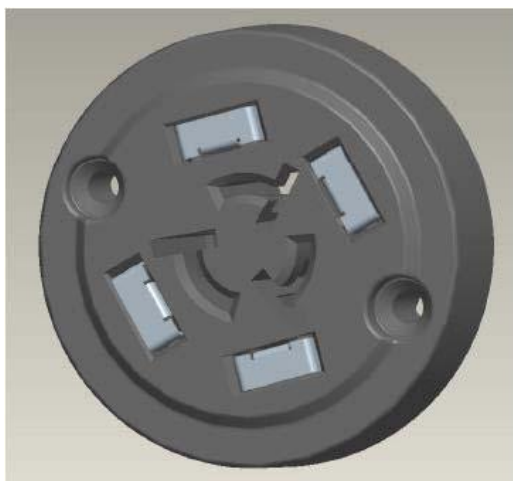


Figure 6: Example of the socket

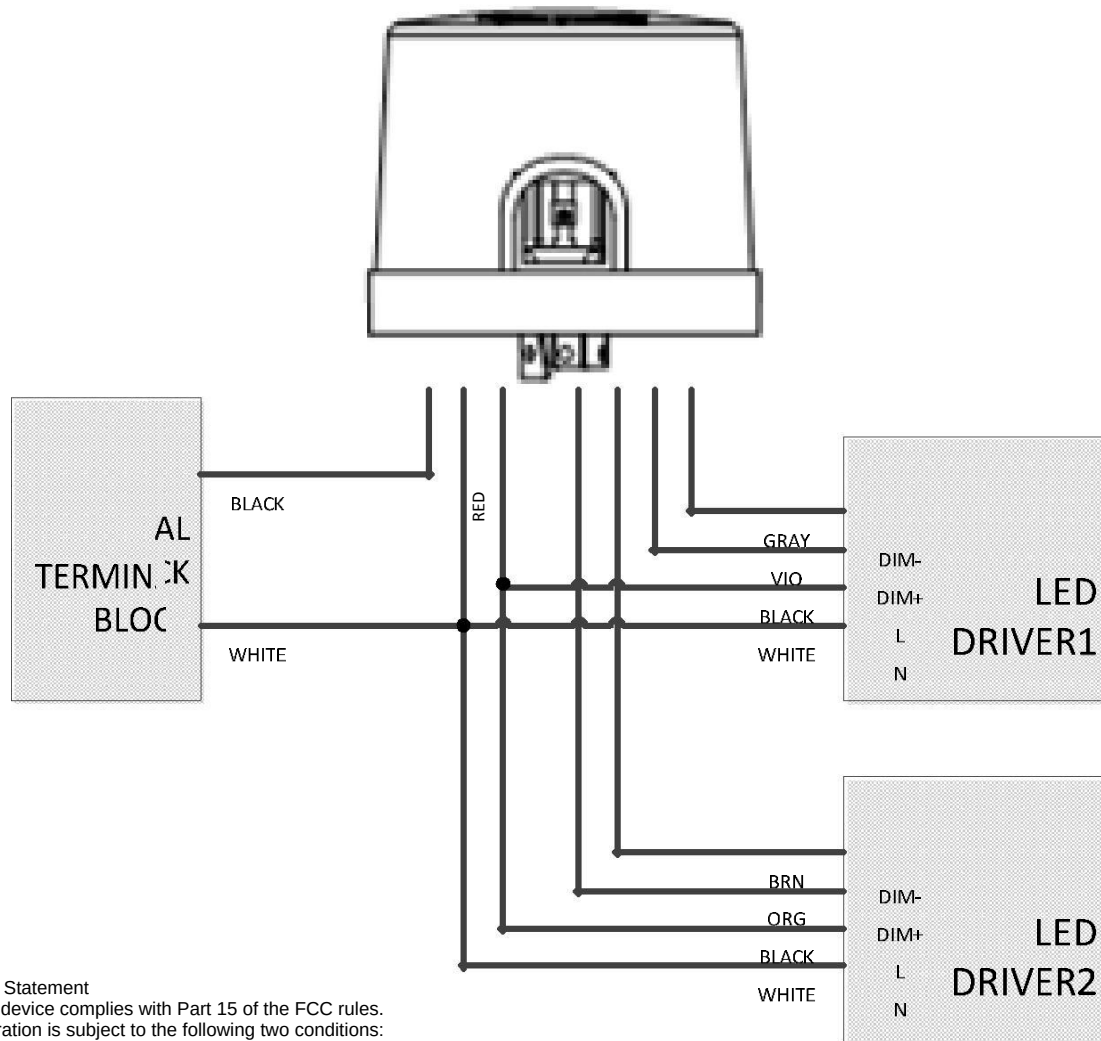


Figure 7: Top view



Figure 8: front view

6.2 Typical Application



FCC Statement

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:
 1) this device may not cause harmful interference, and
 2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to

correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.

--Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. --Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

SAR Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment normal use should be installed and operated with minimum distance 20cm between the radiator & your body.