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SAFETY INSTRUCTIONS

Installation should be performed only by a competent person or professional electrician. Make sure that the installation complies with the standards and rules that apply in your country.

- **Do not use the device if it seems to be damaged.**
- **Use the device only as described in this user manual.**
Any other use or use under other operating conditions is improper and may result in personal injury or property damage.
- **No liability will be assumed for damages resulting from improper use.**
Never open the controller and do not attempt repairs yourself.
- **Do not place the device close to heat sources and always ensure enough ventilation.**
- **Do not place the unit on surfaces that are heat sensitive.**

This device has been designed for indoor use only. Do not expose the unit to direct sunlight. Do not allow this device to meet liquids. Electrical shock could result. Also, damage to the device, smoke, and overheating could result from contact with liquids. Clean the device components that are accessible from the outside regularly. The cleaning frequency depends on the operating environment: damp, smoky or particularly dirty environments can cause greater accumulation of dirt on the device components. Clean with a dry soft cloth. Stubborn dirt can be removed with a slightly dampened cloth.

- **Never use solvents or alcohol for cleaning.**
- **Establish all connections when the unit is switched off.**
Use the shortest possible high-quality cables for all connections.
Make sure that cables cannot cause a trip hazard.
- **Never touch the plug contacts with sharp or metal objects.**
- **Ensure that plastic bags, packaging, etc. are disposed of properly and are not within reach of babies and young children. Choking hazard!**
- **Ensure that children do not detach any small parts (e.g. screws, connectors or the like) from the unit. They could swallow the pieces and choke!**
- **Never let children unattended use electrical devices.**

DEVICE INTRODUCTION

POWERED BULB DIMMER DUAL POLARITY DUAL POLARITY is a special 64 channel SPI dimmer with built-in power supply designed for dimming 31-33V dual polarity constant voltage (CV) fixtures with anti parallel LED diode connection.

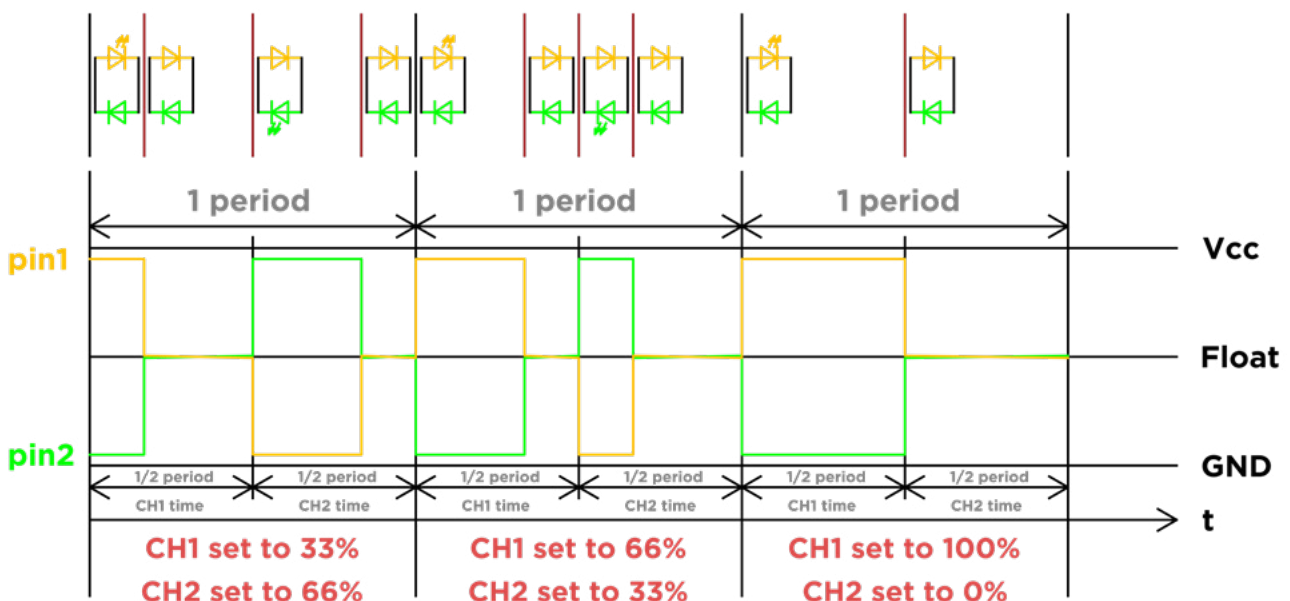
It has 64 independent open-drain outputs ideal for:

- **Xmas lights with anti parallel LED diode connection (odd and even sections controlled)**
- **CCT LED bulbs with anti parallel LED diode connection**

POWERED BULB DIMMER DUAL POLARITY is power supply with SPI dimmer in aluminum enclosure providing “out-of-the-box” solution for entertainment industry.

With its high PWM frequency it is flicker-free on most video cameras, , however as it works on a polarity change principal it will always flicker even on brightness set to maximum.

Each output is controlled by first 16bit of 24bit SPI WS2811 signal . First 8bit is for PWM of one polarity and second 8bit is for PWM of other polarity. To illustrate principal of individual polarity dimming adjustment, following timing diagram represents behavior of one dimmer output with different 8bit values. CH1 representing first 8bit value and CH2 representing second 8 bit value.



DEVICE SPECIFICATION

POWERED BULB DIMMER DUAL POLARITY

SPI Dimmer For 2 Polarity 31-33V LEDs/LED Strings
and our EDISON CCT BULBS

Applications

- General illumination
- Decoration illumination
- Events, lounges, clubs
- Scenography
- Theatre
- Light show
- Special effects
- Showcase



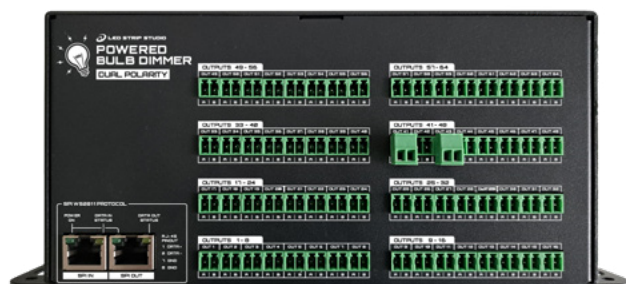
Technical specification

Controls over	SPI
Operating voltage	85-264 VAC 50/60Hz
Rated power	144W
Self power consumption	6W
Maximum power consumption	170W
Power In/Out connector	PowerCON connector 230V/20A
SPI in port connector type	RJ-45
SPI in port type	Differential 800kHz SPI (WS2811, WS2812B, SK6812, TM1809....)
SPI in port protection	Yes, ESD
SPI out port connector type	RJ-45
SPI out port type	Differential 800kHz SPI (WS2811, WS2812B, SK6812, TM1809....)
SPI out port protection	Yes, ESD
Output Channels total	64
OUTPUT port (connectors) count	64
OUTPUT port connector type	2 pole pluggable terminal block pitch 3,5mm for wire 0,5...1,5mm²
OUTPUT port electrical type	Dual polarity PWM
OUTPUT port contain power	33V, max 0,1A/port, max 4A total
OUTPUT port Balanced power	62mA / Channel
Output connector pins	A,B
Status LEDs on RJ45 connetors	Green: Power, Yellow: SPI status
LED output dimming type	PWM
Grayscale	8bit (256 levels)
PWM Frequency	>1000Hz
Maximum controller count	16

DATA I/O max. cable length	100m with Cat5e or better
Works with controller	Like WS2814 800 kHz SPI RGBW (with SPI MATRIX RJ-45 version use WS2811 RGBW)
Operating air temperature	-10°C to 45°C
Storage air temperature	-30°C to 60°C
Relative humidity	5% to 80% non-condensing
Waterproof	No
Ingress protection	30
Weight	1290g
Dimensions	243,5 x 93 x 105 mm
Enclosure	Aluminium
Mouting options	Side tabs with holes for screws, cable ties, clamps, safety wire

Default package content

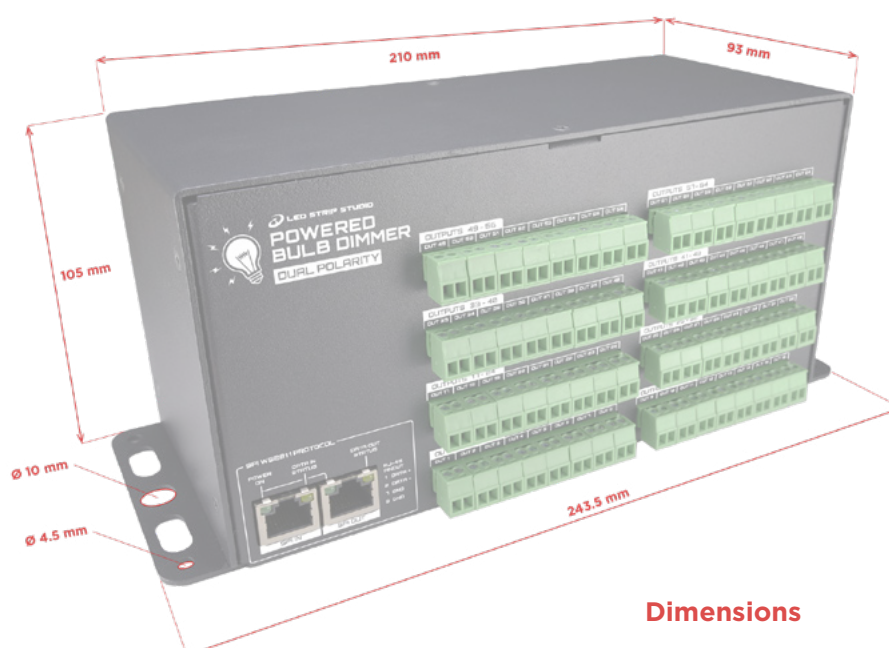
- POWERED BULB DIMMER
- 64pcs 2 pole terminal block plug pitch 3,5mm
- PowerCon power cable with plug based on destination country



Front View



Rear View



Dimensions

DEVICE VARIANTS

By default, POWERED BULB DIMMER DUAL POLARITY has built in power supply set to 33V. On customer request can be supplied with different voltage power supply.

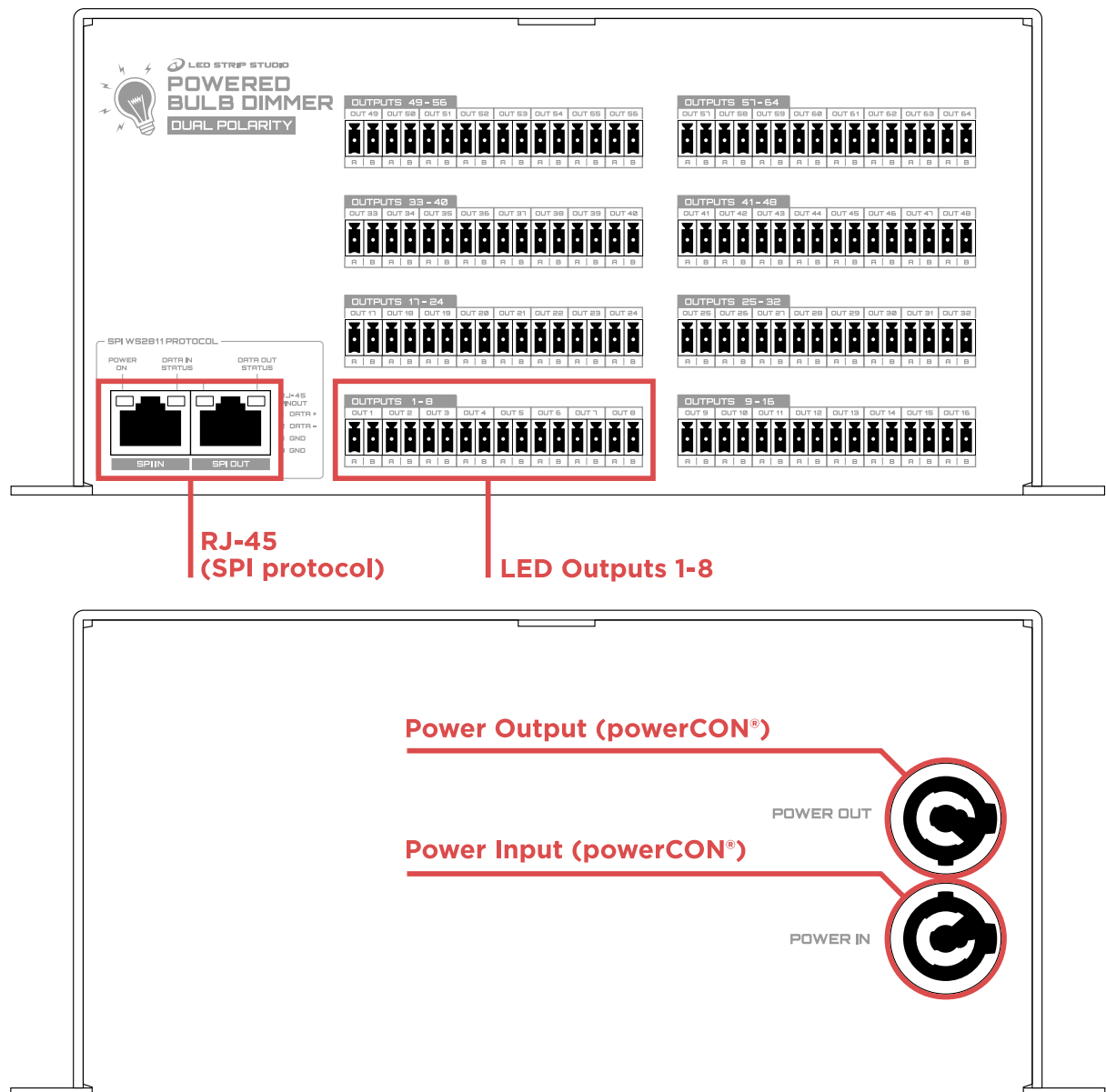
DEVICE COMPATIBILITY

POWERED BULB DIMMER DUAL POLARITY can be controlled by any SPI controller with differential 800kHz SPI (WS2811, WS2812B, WS2814, SK6812, TM1809....), like our [LEC 3](#) or [SPI MATRIX](#). Third party controllers with aforementioned ICs are compatible as well.

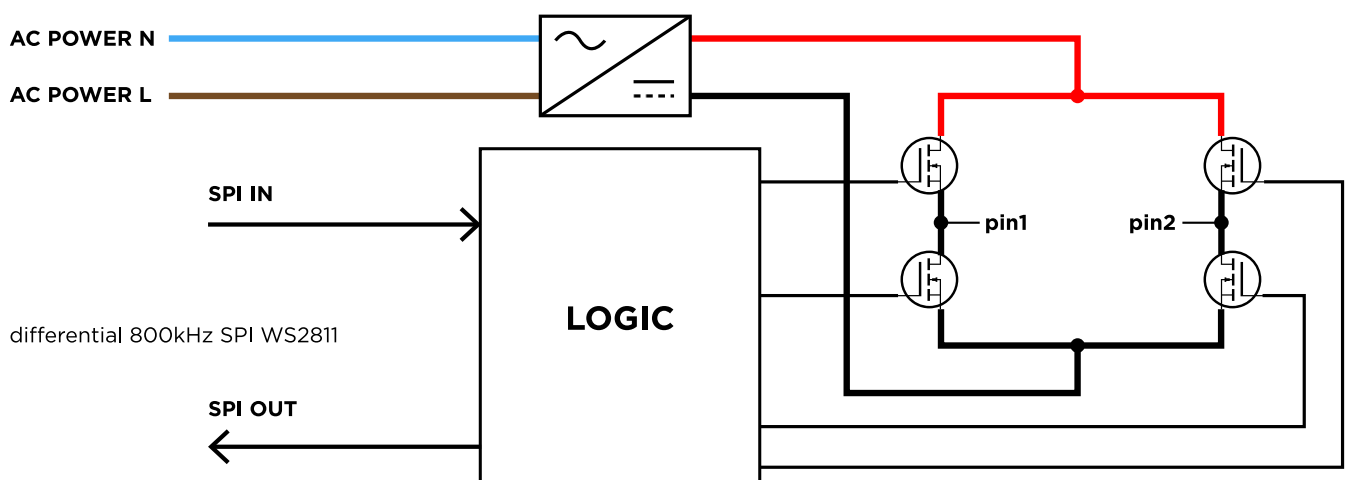
We encourage you to check our [LED STRIP STUDIO](#) software which is powerful tool able to generate WS2811 signal, not only for POWERED BULB DIMMER DUAL POLARITY.

POWERED BULB DIMMER DUAL POLARITY can be used to control [EDISON CCT LIGHT BULB](#) produced by LED STRIP STUDIO.

DEVICE OVERVIEW

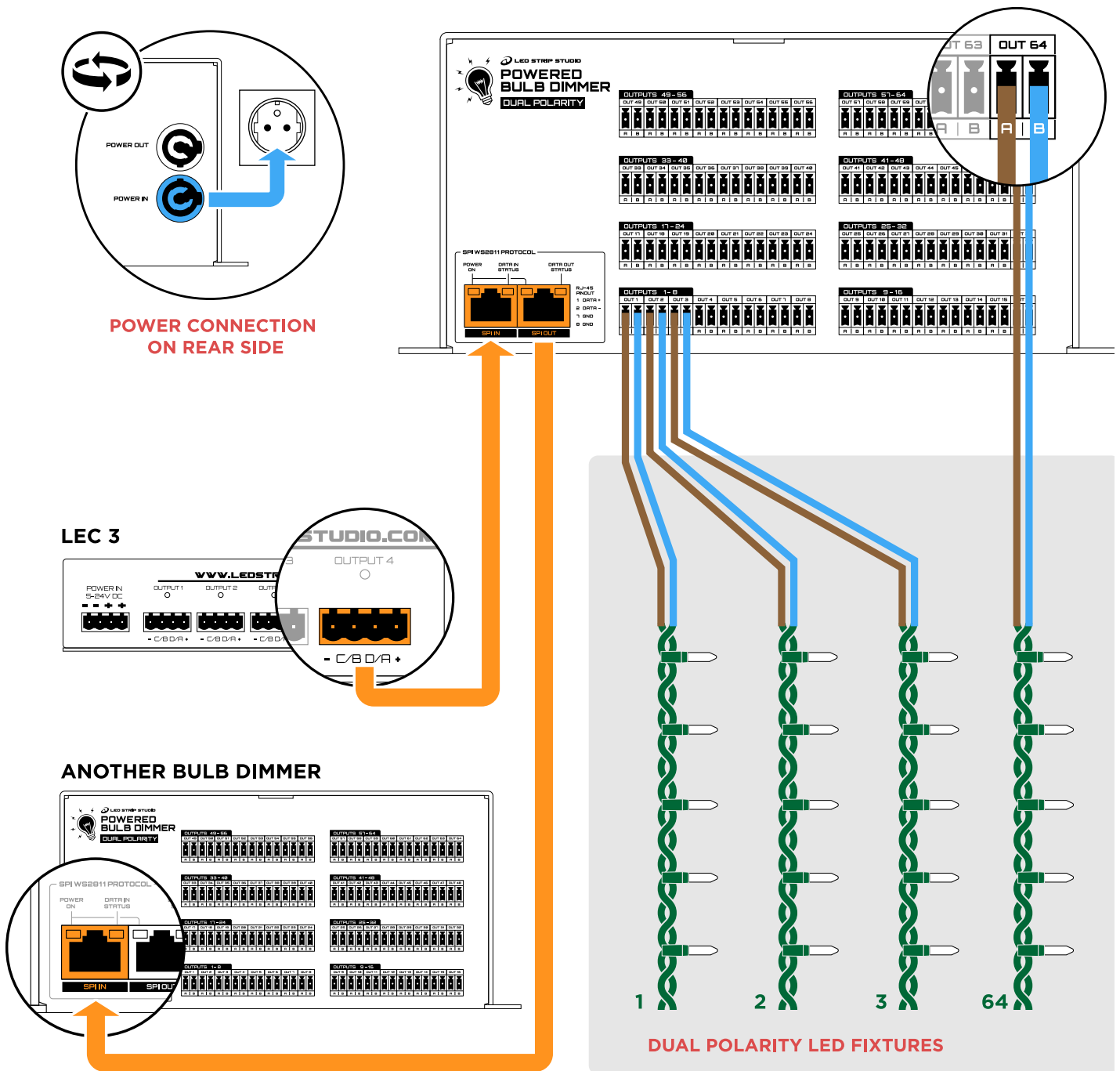


DEVICE BLOCK DIAGRAM

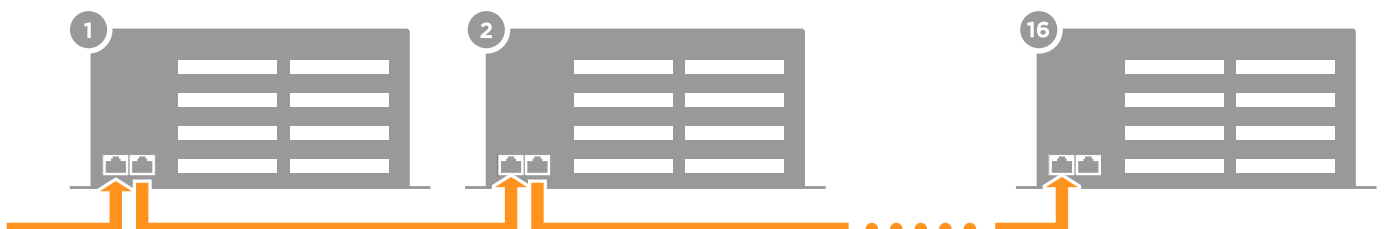


DEVICE CONNECTION

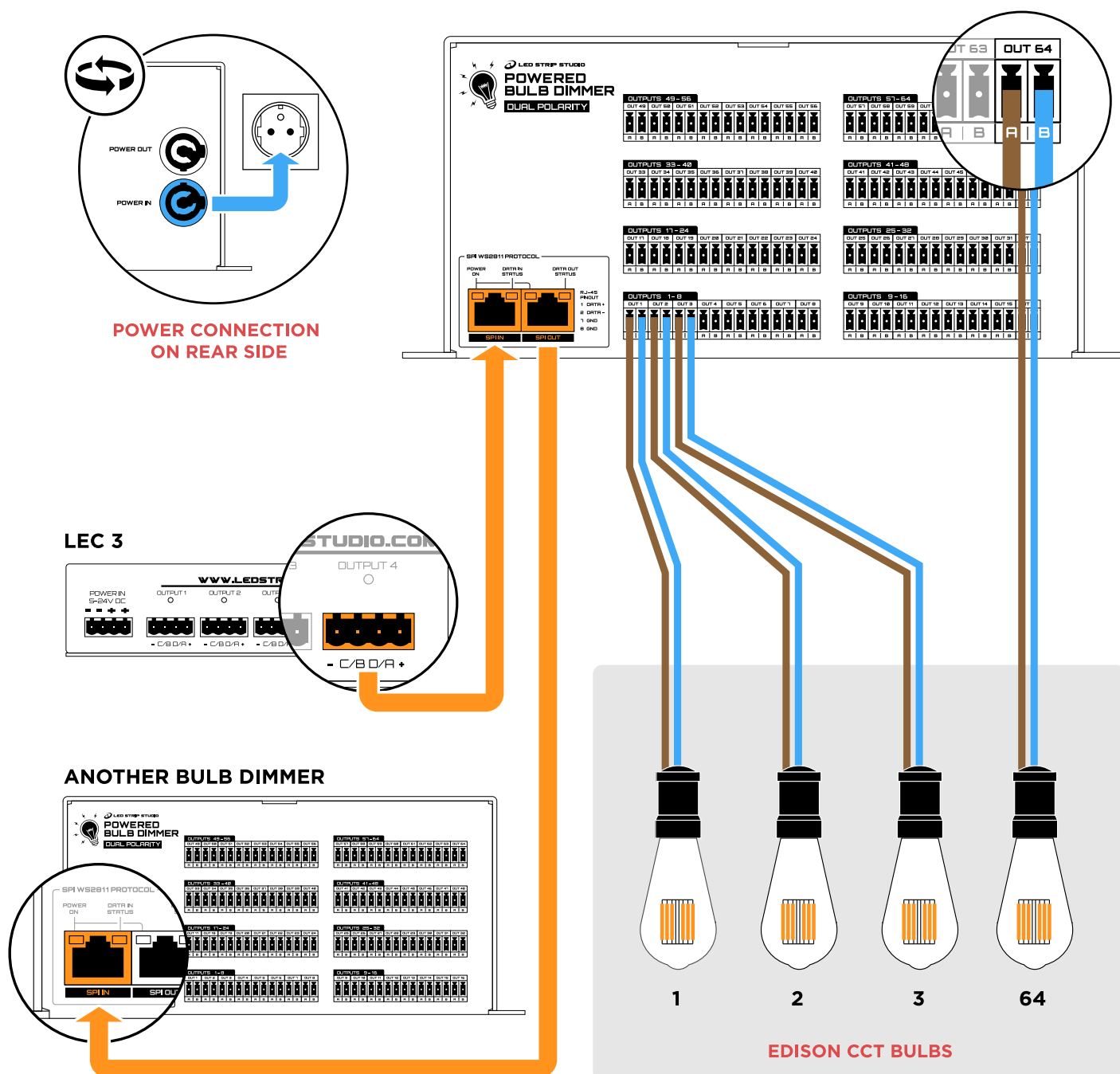
Connection scheme example of POWERED BULB DIMMER DUAL POLARITY:



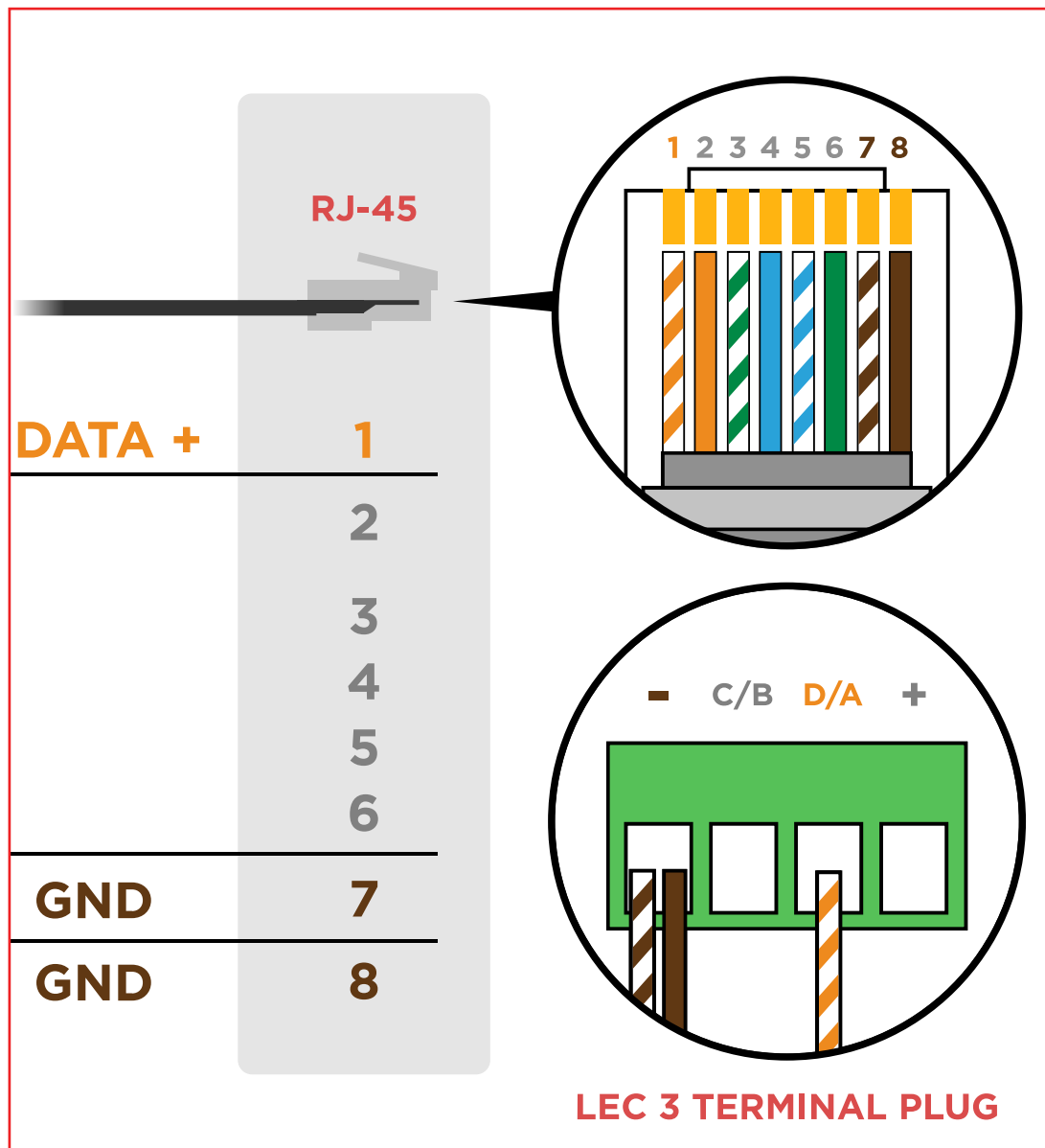
You can daisy chain up to 16 POWERED BULB DIMMERS together



Connection scheme example of POWERED BULB DIMMER DUAL POLARITY with RGBW strip:

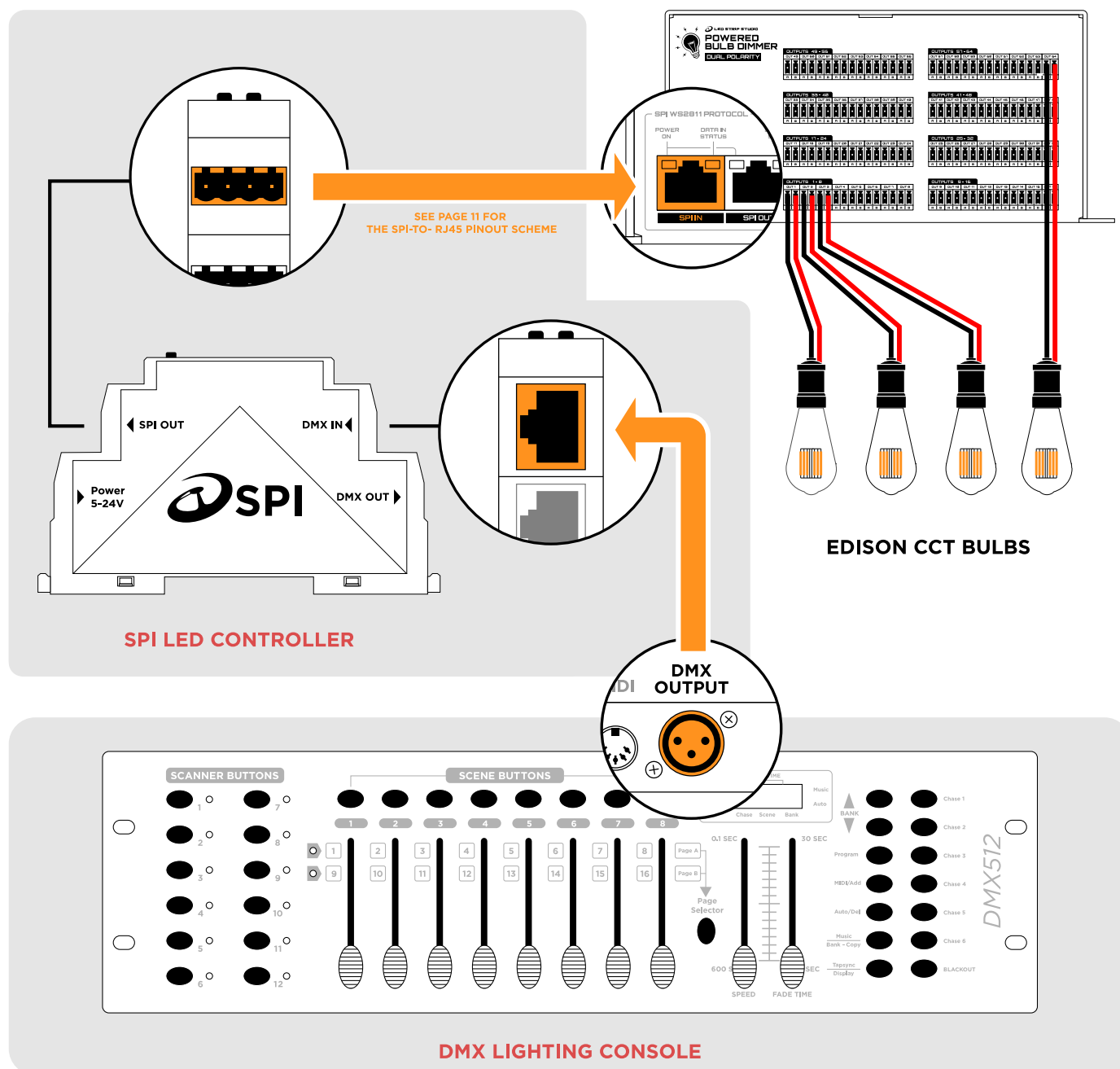


SPI TO RJ-45 PINOUT



CONTROL WITH DMX

The POWERED BULB DIMMER DUAL POLARITY can be controlled via DMX using an **SPI LED CONTROLLER**:



There are two variants of control via DMX:

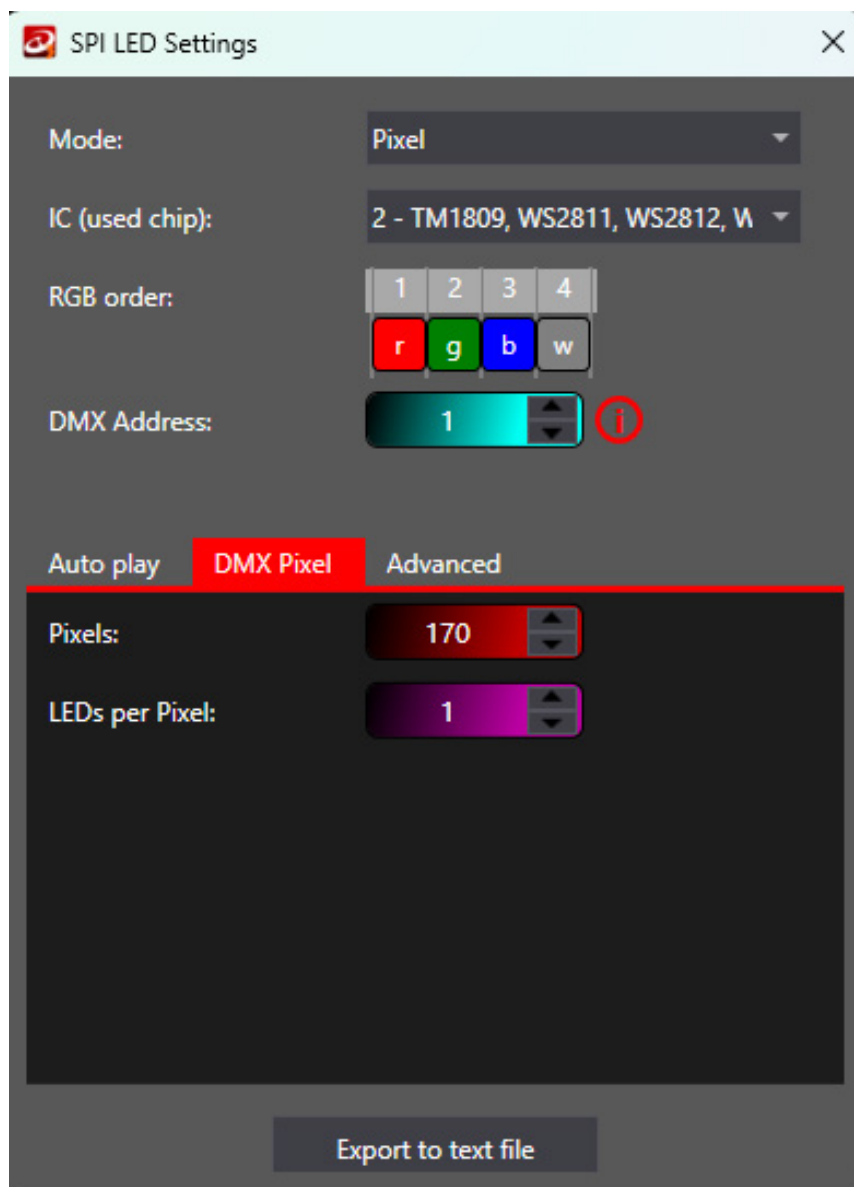
- **PIXEL MODE**
- **SD CARD MODE**

PIXEL MODE

This mode converts incoming DMX signal into RGB pixel format.

In **LSS3 software** you can set starting DMX address and define how many pixels should be used (in DMX Pixel tab). Each pixel uses 3 DMX channels for red, green and blue color. In this case each POWERED BULB DIMMER DUAL POLARITY output used one DMX channel.

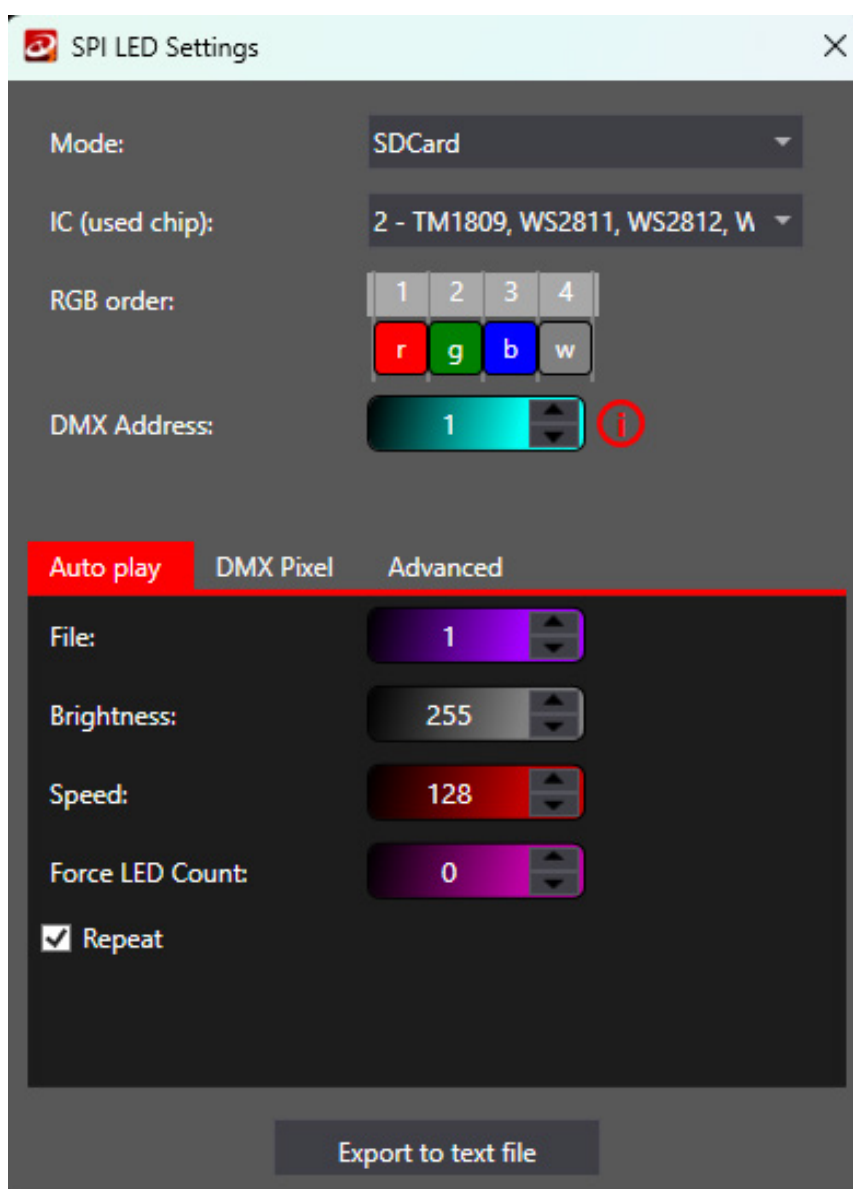
You need to select WS2811 RGBW as used chip type.



SD CARD MODE

In this case, SPI LED Controller uses LN2 files from the SD Card to be played. LN2 files can be also create in **LSS3 software** na stranke. You set starting DMX address and it need 7 DMX channels:

1. **BRIGHTNESS**
2. **ANIMATION**
3. **ANIMATION SPEED**
4. **RED**
5. **GREEN**
6. **BLUE**
7. **WHITE**



FAQ

WHAT IS A SPI WS2814 PROTOCOL?

Motorola developed the SPI architecture in the 1980s . A serial peripheral interface (SPI) is an interface commonly used in computers and embedded systems to facilitate short-distance communication between a microcontroller and one or more peripheral integrated circuits (ICs).

WS 2811 protocol is used for led drivers ICs. It used 24bits data, 8bits for each RGB color (32bits when it is RGBW).With 8bits you can set value in range 0-255. You can find a lot of information on internet.

HOW MANY LEDS CAN BE CONNECTED TO POWERED BULB DIMMER DUAL POLARITY?

It depends on your LED fixture specification. Basically it is important to NOT overload output(s). You can connect multiple LED fixtures to each output, but you cannot exceed Maximum output current per output specified in this manual or POWERED BULB DIMMER DUAL POLARITY datasheet. Of course if you connect more LED fixtures to single output, they will not be individually controllable.

HOW MANY POWERED BULB DIMMER DUAL POLARITY CAN BE CONNECTED TO ONE SPI OUTPUT ?

For optimal frame rate you can connect 16 devices in daisy chain. In case you need to connect more than 16 devices, you need use another SPI output. For example our LEC 3 PRO has 4 SPI outputs, so you can connect 4x16 POWERED BULB DIMMER DUAL POLARITY.

HOW MANY CHANNELS AND WHICH COLORS ARE USED TO RENDER CONTENT IN LSS SOFTWARE AND 3RD PARTY PROGRAMS?

You need 2 channels to control your fixtures for each output. E.g if you are using our Edison CCT bulbs, you need to set the fixture in software as using 2 channels (not three, not four). Colors that will display the content will be Green (G) and Red (R). Check your color order before testing.

WARRANTY

This device has been designed and made using high quality components with several quality checks and testings. Therefore we are proud to provide **5 year** limited warranty for this device.

This limited warranty is valid for company or person (user) who purchased new device from us, or our authorized dealer/distributor and warranty period starts from date when user receive this device.

Limited warranty cover:

- **material defects**
- **assembly failures**
- **device malfunction**
- **this device only**

Limited warranty DO NOT cover and is void when this device:

- **has been used for different usage as specified in this manual**
- **has been opened without our permission**
- **has been modified or disassembled without our permission**
- **has been operated wrong way. E.g. over-voltage, over-current, exposed to high electromagnetic fields/discharges such as lighting strikes or ESD events with parameters way outside of HBM model**
- **has been stored or used outside of storage/operating temperature and humidity**
- **has been used in aggressive environment, corrosive environment, dusty environment or in environment with increased vibrations**
- **has been in contact with liquids**
- **has been connected wrong way. E.g. Short circuits, reverse polarity etc.**
- **has been mechanically damaged**
- **got unofficial attempts to firmware updates**

Limited warranty DO NOT cover:

- **shipping expenses to handle defective device.**
- **failures or damage of other equipments connected to this device**
- **user expenses caused by defective device**

For limited warranty claim process:

- **user must be able provide sufficient proof of purchase**
- **use email info@ledstripstudio.com with detailed description of device failure**
- **takes less than 30 days to resolve. This period starts from day we physically receive defective device (device return)**

DISPOSAL OF YOUR OLD DEVICE

This device is an electronic device, and can be categorized as hazardous waste in your country. Dispose of this device through an approved waste disposal firm or through your local waste facility. When discarding the device, comply with the rules and regulations that apply in your country. If in doubt, consult your local waste disposal facility.

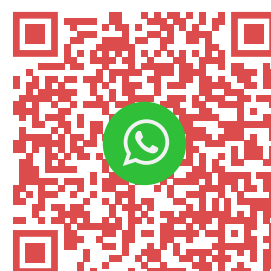
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