LDT-ZB-RF-SPI-1000-UL

Zigbee & RF RGB/RGBW SPI Controller, UL-Documented Variant

A Zigbee and compatible RF pixel-control interface for addressable RGB/RGBW lighting, in the manufacturer-documented UL-marked hardware variant. Configure the actual IC, colour order, pixel count and power-injection arrangement.

Supply voltage	5-24 VDC
Output type	2 x SPI (TTL), data + clock
Control inputs	Zigbee + proprietary 2.4 GHz RF
Lighting type	Digital RGB / RGBW; exact IC and colour order must be configured
Maximum pixel count	1000 pixels
Published IC support	49 IC families; full list in guide
Scenario modes	44 default and 10+ custom; 16 variations
Music functions	3 app music rhythms
Rated input current	8 A; this is not an SPI signal load-current rating
Hardware-document variant	UL-marked component variant; verify supplied model and order-specific certification
Operating temperature	-30 to +55 °C
Maximum case temperature	+65 °C
IP rating	IP20
Body dimensions	114 x 38 x 20 mm

The UL reference is attached to the documented component variant; it is not a claim that every Lediot product or installation is UL-certified. App/cloud and voice features require the supported gateway/network/account services. SPI outputs are signals, not analogue PWM power channels.

The following reference pages include the complete wiring, dimensions, settings and operating instructions. Use the lighting and hardware variant identified above; shared references may illustrate other separate models.

Zigbee + RF

ZigBee RGB/RGBW SPI LED Controller

Features

- Multi-pixel RGB/RGBW LED strip controller with SPI signal output, Control app clou
- Voice control, support for Amazon Alexa, Google Assistant, Tmall Genieand Xiaodu
- Compatible with RGB or RGBW LED strips with 49 kinds chip, the chip type and R/G/B/W color sequence can be set through the APP. Compatible chip: TM1809(default), TM1804, TM1812, UCS1903, UCS1909, UCS1912, SK6813,UCS2903, UCS2909, UCS2912, **WS2811, WS2812, WS2813, WS2815 SM16703P TM1803,** TM1829, TLS3001, TLS3002, GW6205, MBI6120, TM1814B(RGBW), **SK6812(RGBW), WS2813(RGBW), WS2814(RGBW), UCS8904B(RGBW),** LPD6803, LPD1101, D705, UCS6909, UCS6912, LPD8803, LPD8806, WS2801, WS2803, P9813, SK9822, TM1914A, GS8206, GS8208, UCS2904, SM16804, SM16825, SM16714(RGBW), UCS2603, UCS5603, SM16714D, UCS7604(RGBW), UCS7804(RGBW).
- Painted segment color mixing: full color filling, color pencil segment painting, eraser segment light off.
- Rich dynamic effects: 44 default and 10+ custom dynamic scenarios, 16 variations.
- 3 APP music rhythms.
- Match with RF 2.4G RGB remote control optional, such as RF control



Notice:
Please use in a dry environment
This control circuit is not isolated-see installation instructions
Remarque: Ce circuit de commande n'est pas isolé
- voir les instructions d'installation

E543518

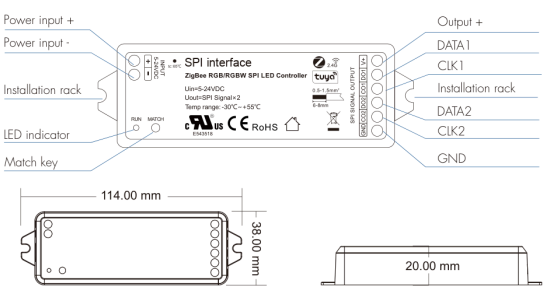
Technical Parameters

Input and Output	
Input voltage	5-24VDC
Input Current	8A
Input signal	ZigBee + RF 2.4G
Output signal	SPI(TTL) x 2
Scenario Mode	44 default and 10 + customizations
Pixel Dots	MAX.1000

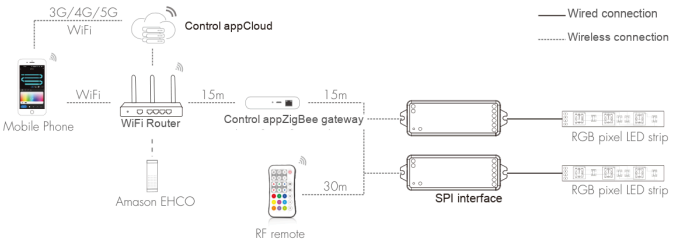
Environment	
Operation temperature	Ta: -30°C ~ +55°C
Case temperature (Max.)	Tc: +65°C
IP rating	IP20
Package	
Size	L120 x W43 x H27mm
Gross weight	0.066kg

Safety and EMC	
EMC standard	EN IEC 55015/ EN IEC 61547 ETSI EN 301 489-1/-3/-17
Safety standard	EN 60669-1/-2
Radio Equipment	ETSI EN 300 440 TSI EN 300 328
Certification	CE RoHS UL
Warranty	5 years

Mechanical Structures and Installations



System Wiring



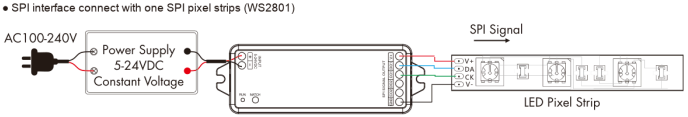
Note:
1. The above distance is measured in spacious (no obstacle) environment, Please refer to the actual test distance before installation.
2. Users must use the Control appZigBee gateway to realize remote control and voice control.

Wiring Diagram

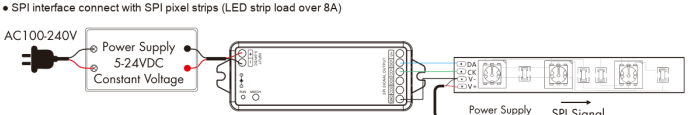
- SPI interface connect with SPI spotlights (TM1803)



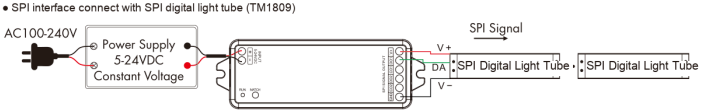
- SPI interface connect with one SPI pixel strips (WS2801)



- SPI interface connect with SPI pixel strips (LED strip load over 8A)



- SPI interface connect with SPI digital light tube (TM1809)



Wire Preparation:

1. The wiring can be solid or stranded with a cross-sectional area of 0.5 to 1.5 mm². Conventional 1mm² can withstand 10A output current.
2. When wiring is installed, the terminals must be tightened. If they are not tightened, the contact point resistance will be too high and the terminals will easily burn due to heat when used at full load for a long time.



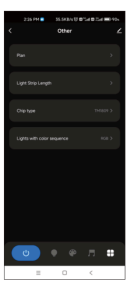
Installation Precautions:

1. If the SPI LED strip is a single-wire control method, the DATA and CLK signal line outputs of the controller are same, and one controller can connect 4 LED strips.
2. When the load of the light strip exceeds 8A, the light strip needs to be powered by another power supply (the light strip and the power supply must share the same ground), and only the DATA/CLK and GND lines are connected between the controller and the light strip.
3. The output power of the constant voltage power supply is at least 1.2 times that of the output load (light strip), otherwise the full power output of the load will easily cause the lights to flicker or shake automatically.
4. The voltage of the power supply needs to be the same as the voltage of the light strip to avoid the phenomenon of the light strip not being lit or slightly lit.
5. When installing, the length of the signal line (DATA/CLK) needs to be ≤ 10 metres, and if it exceeds 10 metres, it needs to be connected to an SPI signal amplifier (common ground) for signal amplification, to avoid signal interference due to the line being too long.
6. **When installing, the SPI signal lines (DATA, CLK) need to be separated from the strong power (100~240VAC) lines** at a distance of ≥15cm to avoid the magnetic field generated by the strong power from interfering with the signal transmission.
7. Each signal output port (DATA/CLK) can only be connected to one set of light strips.
8. The light strip is always on without control, it may be that the signal line (DATA/CLK) is open or the chip of the light strip is damaged, **it is recommended to replace the signal line or the light strip.**

Control app Network Connection

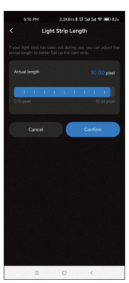
Press and hold Match key for 5s, or push twice Match key fastly:
clear previous network connection, enter config mode, LED indicator flash fastly.

In Control app, you can find SPI interface device.
If Control app network connection succeed, the RUN LED indicator will stop flash.



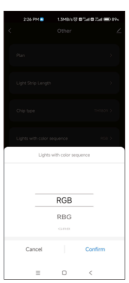
Other interface

For the first time use, set LED strip length, chip type and color sequence.



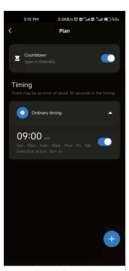
Light Strip Length interface

Strip length setting:
Select the appropriate number of pixels according to the actual length of the strip, 10-1000.



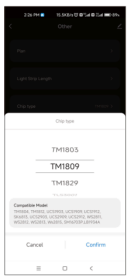
Lights with color sequence interface

Select the corresponding R/G/B/W sequence according to the color sequence of the light strip. (RGB, RBG, GRB, GBR, BRG, BGR, RGBW, RBGW, GRBW, GBRW, BRGW,BGRW, WRGB,WRBG, WGRB, WGBR, WBRG, WBGR)



Plan interface

Countdown:
Customize the countdown time (Max.24 hours) to perform the on/off action.
Timer: Customize multiple times to perform the on/off light action.

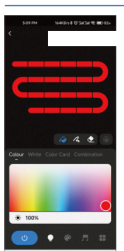


Chip type interface

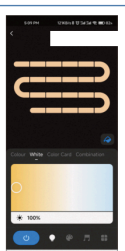
Select the corresponding chip according to the chip type of the light strip.

Chip Type	Compatible Chip
TM1803	
TM1809	TM1804, TM1812, UCS1903, UCS1909, UCS1912, SK6813,UCS2903, UCS2909, UCS2912, WS2811, WS2812, WS2813, WS2815, SM16703P
TM1829	
TLS3001	TLS3002
GW6205	
MBI6120	
TM1814B(RGBW)	
SK6812(RGBW)	WS2813(RGBW), WS2814(RGBW)
UCS8904B(RGBW)	
LPD6803	LPD1101, D705, UCS6909, UCS6912
LPD8803	LPD8806
WS2801	WS2803
P9813	
SK9822	
TM1914A	
GS8206	GS8208
UCS2904	
SM16804	
SM16825	
SM16714(RGBW)	
UCS5603	
UCS2603	
SM16714D	
UCS7604(RGBW)	
UCS7804(RGBW)	

Control app Interface



Colour:
Touch the color rectangle to adjust color and saturation. Touch the brightness slide to adjust brightness.



White:
Touch the color rectangle to adjust color temperature. Touch the brightness slide to adjust brightness.



Color Card:
Touch the color card array to select many different colors. Touch the brightness slide to adjust brightness.



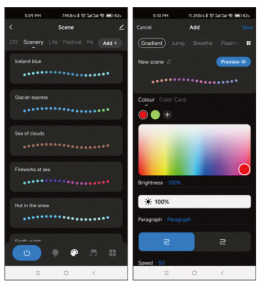
Combination:
Select a proportional distribution of multi-color circle, evenly distribute these colors on the LED strip.

Color Fill: Change the color of the full segment of the LED strip.

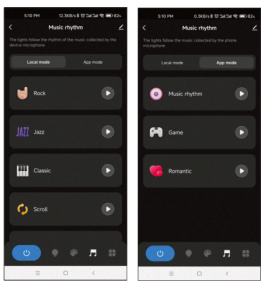
Color pen: change the color of a single segment of the LED strip.

Eraser: Erase the color of a single segment of the LED strip, i.e., turn off the light.

Color transition: When there are multiple colors in the LED strip, you can set to turn on or off the color segment gradient transition.



Scene interface
44 predefined scenarios and 10+ custom dynamic scenarios selectable.
The custom scenarios can select 16 types variations (fade, jump, breath, flash, flow, rainbow, shooting star, pile-up, floating down, chasing light, floating, flashing, bouncing, shuttle, chaotic flashing, open and close), the 1-8 colors, full or segment control, forward or reverse motion direction, adjustable brightness and speed.



Music rhythm interface
6 local music modes (rock, jazz, classical, rolling, energy, spectrum) selectable.
3 APP modes (music rhythm, game, romance) selectable.
Adjustable sensitivity of the received sound.
The light follows the rhythm according to the music collected by the phone microphone.
Note: the controller only supports App mode.

Notes.
1. In APP, a light strip is fixed with 20 segments, strip length (total number of pixel points) ÷ 20 segments = number of pixel points per **segment.**
2. The maximum length of the light strip is 1000 pixels, for example, a light strip of 5 meters long with 60 pixels per meter, **you can set the length to 300 pixels.**
   The whole light strip is divided into 20 segments, each segment has 15 pixels.
3. When the light strip length is less than or equal to 20 pixels, for example, 10-20, each pixel sequentially corresponds to each segment from the beginning.
4. When the light strip length is not an integer multiple of 20, the remainder of the strip will display the color of the last segment.
5. When the actual light strip length is not an integer multiple of 20, it is recommended to set the length longer and increase the value to a multiple of 20.
6. When the set of the light strip length is less than the actual length, the back part of the light strip can not be controlled.
7. When the selected dynamic mode cycle running interval is too long, please reset the correct pixel length.
8. When the static or dynamic mode color display is not consistent with the APP interface, please re-select the light strip color sequence.

Restore Factory Default Setting

Factory default parameters: RGB light type, pixel length 300, TM1809 chip type.
1. Long press the match key for 15s, restore the factory default parameter settings, and set RGB color light and W white light can be turned on at the same time(When changing the chip type to RGBW lighting).
2. Long press the match key for 20s, restore the factory default parameter settings, and set RGB color light and W white light can not be turned on at the same time(When changing the chip type to RGBW lighting).

Match Remote Control

End user can choose the suitable match/delete ways. Two options are offered for selection:

Use the controller's Match key

Match:
Short press match key,
immediately press on/off key on the remote.
The LED indicator fast flash a few times means match is successful.

Delete:
Press and hold match key for 10s to delete all match,
The LED indicator fast flash a few times means all matched remotes were deleted.

Use Power Restart

Match:
Switch off the power of the receiver, then switch on power, repeat again.
Immediately short press on/off key 3 times on the remote.
The light blinks 3 times means match is successful.

Delete:
Switch off the power of the receiver, then switch on power, repeat again.
Immediately short press on/off key 5 times on the remote.
The light blinks 5 times means all matched remotes were deleted.