

# MC408X | PWM 12-IN-1 Smart LED Group Controller

## MC408X Controller MR Series Remote Control Specification



CE RoHS



MC408B-Bluetooth



MC408W-WiFi



MC408Z-ZigBee

### Compatible remote control

A single device can support 10 remote controls at the same time



MR10X Series



MR11X Series



MR011 DIM/CCT



MR333 RGB



MR20X Series



MR02X Series



MR501-Human body sensor

### Compatible voice assistant

Support language command switch, adjust brightness, and color.



小米小爱



小智管家



天猫精灵



百度小度



Amazon Alexa



Yandex Alice



Google Assistant

### Local and Remote Control:

MESH Remote: Controls local physical buttons through MESH (like on/off, group switching, basic dimming), perfect for seniors, kids, or quick operation.

MESH 12-in-1 Controller: Through Wi-Fi/Bluetooth/Zigbee gateway and Tuya ecosystem, it supports remote app control, allowing precise brightness adjustment and dynamic effects. You can also share devices, create groups, and more, offering endless possibilities for lighting and ambiance, bringing you a smarter, more convenient, and personalized experience.

### peculiarity

- The MC408X is a multifunctional LED controller compatible with 12 different types of LEDs.
- Each node of the controller has a signal relay function, making long-distance transmission more sensitive and power consumption lower.
- Supports multiple control methods, including App control, smart speaker voice commands, and MESH series remote control.
- MESH wireless transmission technology provides stable signals with strong penetration.
- Supports multiple device matching, allowing simultaneous control of multiple devices. One remote can manage and synchronize up to 500 controllers. Each controller can be supported by 10 remotes. (Control distance: 30 meters)
- The brightness of the remote can be adjusted according to personal preference, and the brightness and speed of dynamic modes can be edited.
- The controller can adjust brightness, color, voice control, choose various dynamic or customized scene modes, set timers, countdowns, and other functions through the Tuya/Smart Life APP.
- Device click-to-run and automation, with automatic transmission and synchronization functions.
- Uses PWM (Pulse Width Modulation) technology to ensure smooth light transitions and avoid eye fatigue.
- Voice control supports Amazon Alexa, Google Assistant, Tmall Genie, Xiaomi Xiaoi voice assistants, and other smart speakers.
- Supports multi-controller cascading, easily covering large area lighting scenarios such as shopping malls, theaters, and building facades.

Device parameters

LED controllers

|                      |                            |
|----------------------|----------------------------|
| Input voltage        | DC 5-24V                   |
| Input current        | 6A/CH; 12A max             |
| Access signal        | MESH+WIFI/Bluetooth/Zigbee |
| Control the distance | 30M                        |
| Size                 | L78XW56XH25mm              |
| Authentication       | CE,ROHS                    |

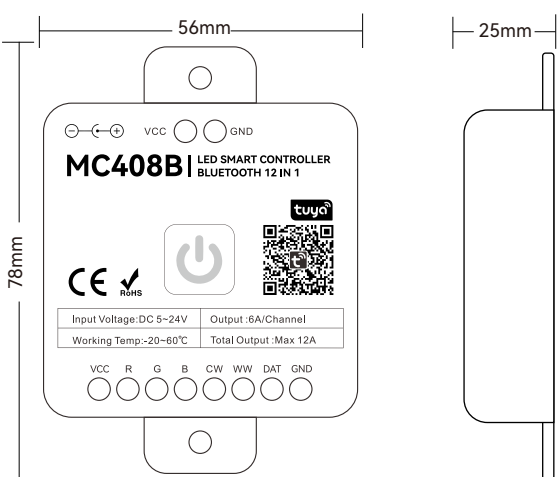
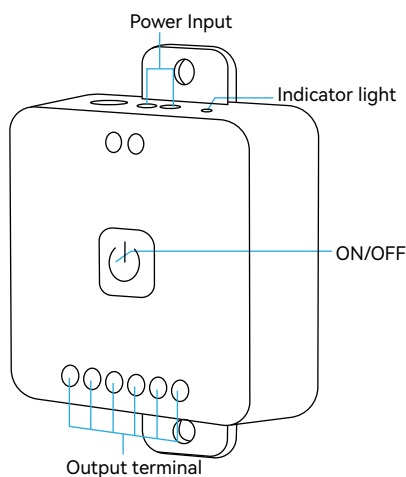
Environment

|                                 |                |
|---------------------------------|----------------|
| Operating temperature           | Ta:-20°C~+60°C |
| Maximum temperature of the case | Tc:+65°C       |
| IP rating                       | IP20           |

Wrap

|                    |                   |
|--------------------|-------------------|
| Package size       | L6.55XW8.6XH2.2cm |
| Box size (100 pcs) | L44XW 33.8XH9.8cm |

Equipment mechanism and installation



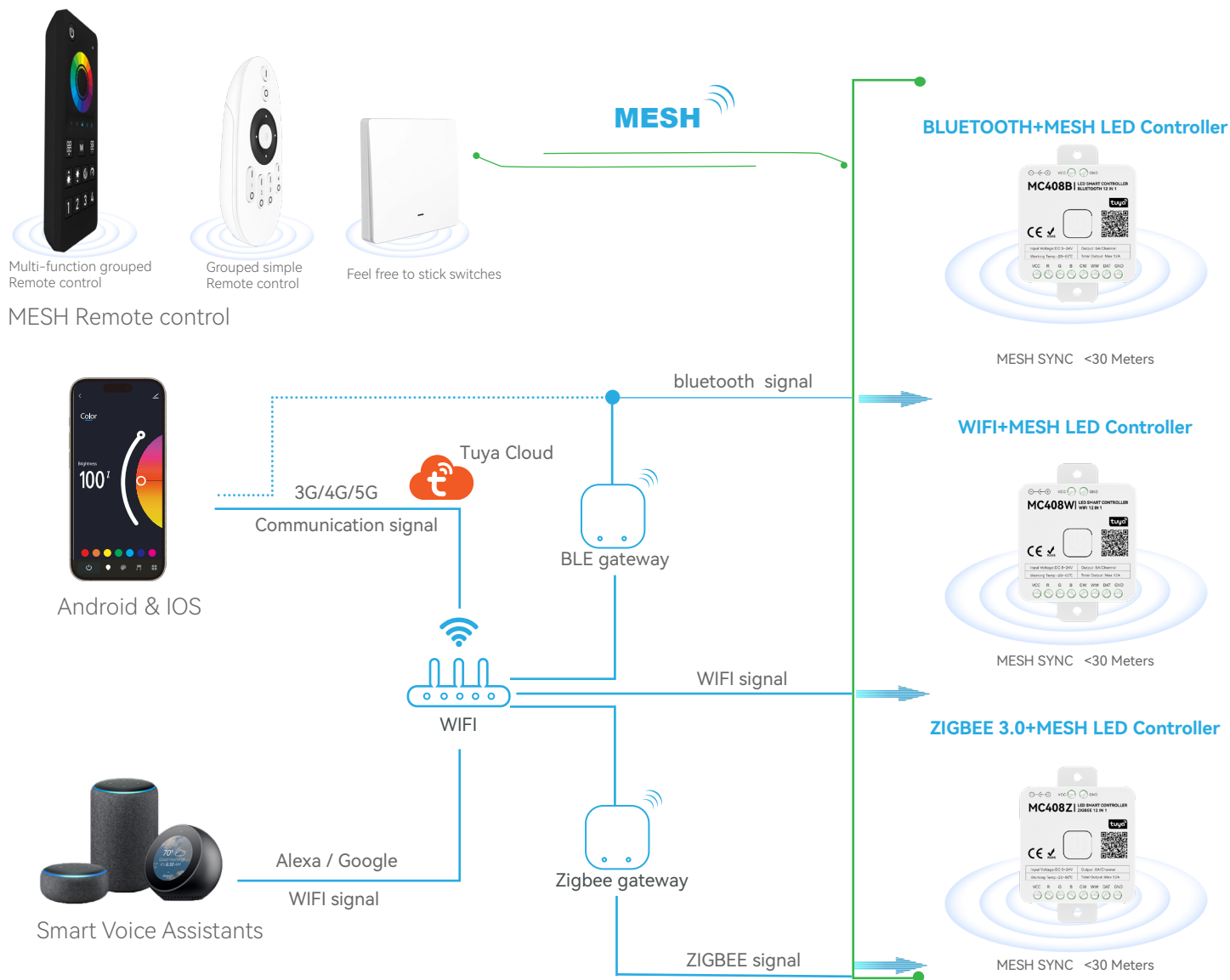
Device Wiring

Different types of LEDs correspond to different output ports; the ports match the selected LED type, along with the following specific port descriptions.

| LED Type |                     | Wiring port |   |   |   |    |    |     |     | Main parameters                 |
|----------|---------------------|-------------|---|---|---|----|----|-----|-----|---------------------------------|
|          |                     | VCC         | R | G | B | CW | WW | DAT | GND |                                 |
| 1        | 1CH PWM DIM         | √           |   |   |   | √  | √  |     |     | Output:6A/CH                    |
| 2        | 2CH PWM CCT         | √           |   |   |   | √  | √  |     |     | Output:6A/CH                    |
| 3        | 3CH PWM RGB         | √           | √ | √ | √ |    |    |     |     | Output:6A/CH Max 12A            |
| 4        | 4CH PWM RGBW        | √           | √ | √ | √ | √  |    |     |     | Output:6A/CH Max 12A            |
| 5        | 5CH PWM RGBCCT      | √           | √ | √ | √ | √  | √  |     |     | Output:6A/CH Max 12A            |
| 6        | SPI DIM             | √           |   |   |   |    |    | √   | √   | Max Pixels:1024                 |
| 7        | SPI CCT             | √           |   |   |   |    |    | √   | √   | Max Pixels:1024                 |
| 8        | SPI RGB             | √           |   |   |   |    |    | √   | √   | Max Pixels:1024                 |
| 9        | SPI RGBW            | √           |   |   |   |    |    | √   | √   | Max Pixels:1024                 |
| 10       | SPI RGBCCT          | √           |   |   |   |    |    | √   | √   | Max Pixels:1024                 |
| 11       | SPI RGB+1CH PWM DIM | √           |   |   |   | √  | √  | √   | √   | Output:6A/CH<br>Max Pixels:1024 |
| 12       | SPI RGB+2CH PWM CCT | √           |   |   |   | √  | √  | √   | √   | Output:6A/CH<br>Max Pixels:1024 |

Schematic diagram of the control connection

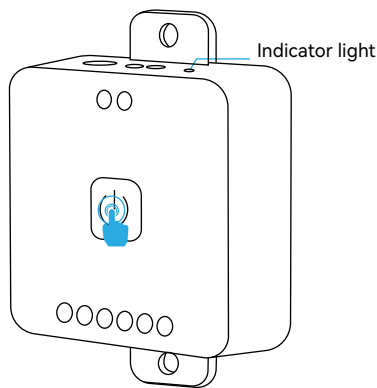
MESH wireless communication technology



Controller Configuration Function Description

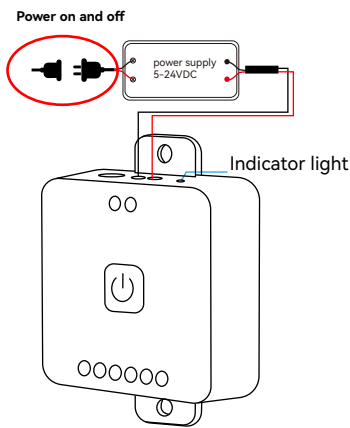
1. Controller Configuration Function Description

1-1. Controller Configuration Settings - SET Button



| Function               |                          | 'ON/OFF' button method                                                                                                                                                                                                   |
|------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ON/OFF                 | 'ON/OFF' button          | Short press (release within 1 second)                                                                                                                                                                                    |
| Pairing remote control | MR Series Remote Control | Press and hold the 'ON/OFF' button for 1-3 seconds and then release it. The controller indicator light will flash rapidly. Next, press any group button on the remote control to complete the remote control pairing.    |
| Network Configuration  | Connect APP              | Press and hold the 'ON/OFF' button for 1-5 seconds, then release it. The controller indicator light will flash slowly, and operate the network configuration on the mobile app.                                          |
| Device Reset           | Clear and reset          | Press and hold the 'ON/OFF' button for 10 seconds and then release it. The controller indicator light will blink slowly, the device will reset, and WiFi network information and remote control pairing will be cleared. |

## 1-2. Controller Configuration Settings - Power On/Off Function Description



| Function               |                          | 'Power on and off method                                                                                                                                                                                              |
|------------------------|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ON/OFF                 | 'ON/OFF' button          | Not supported                                                                                                                                                                                                         |
| Pairing remote control | MR Series Remote Control | After powering on and off three times consecutively, the controller indicator light flashes rapidly, then press any group button on the remote control to complete the remote control pairing.                        |
| Network Configuration  | Connect APP              | After powering on and off 5 times in a row, the controller indicator light flashes slowly, and configure the network on the mobile app.                                                                               |
| Device Reset           | Clear and reset          | After turning on the power 10 times consecutively and then turning it off, the controller indicator light flashes slowly, the device resets, and the WiFi network information and remote control pairing are cleared. |

## 2. Tuya smart download

### Download and install the [Smart Life] or [Tuya Smart] APP

Search for [Tuya Smart] on Apple or Google Play or scan the QR code below to download and install the app. Please click on the "Sign Up" button to create an account and use it for the first time, if you already have an account, log in directly.

Please download the corresponding Tuya/Smart Life APP according to your region.



Scan the QR code to download the APP



Smart Life APP



Tuya Smart APP

## 3. APP network connection

### MC408W-WIFI Connection process

1. Make sure your smartphone is working under a WLAN network.
2. Open the login APP, press and hold "ON/OFF" to add a device, if it is not found, please click "+" in the upper right corner, and then manually select "Add Device", when adding, you need to enter the WiFi password of your smartphone connection, and wait for 5-10 seconds to complete the connection after successfully entering
3. Once the connection is successful, the new device will be displayed on the home page, then tap on the device and enter the control interface to do more

Follow these steps to complete the connection:

Please enter your Wi-Fi information

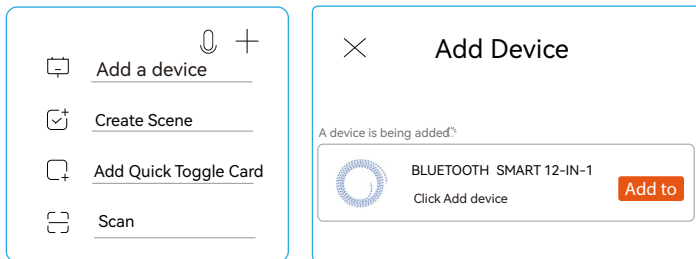
Please select the device to work Wi-Fi and enter the password

### MC408B-BLUETOOTH Connection process

1. Make sure your smartphone is working under a WLAN network.
2. Open the login APP, press and hold "ON/OFF" to add a device, if you don't find it, please click "+" in the upper right corner, then manually select "Add Device", wait for 5-10 seconds to complete the connection.
3. Once the connection is successful, the new device will be displayed on the home page, then tap on the device and enter the control interface to do more

Follow these steps to complete the connection:

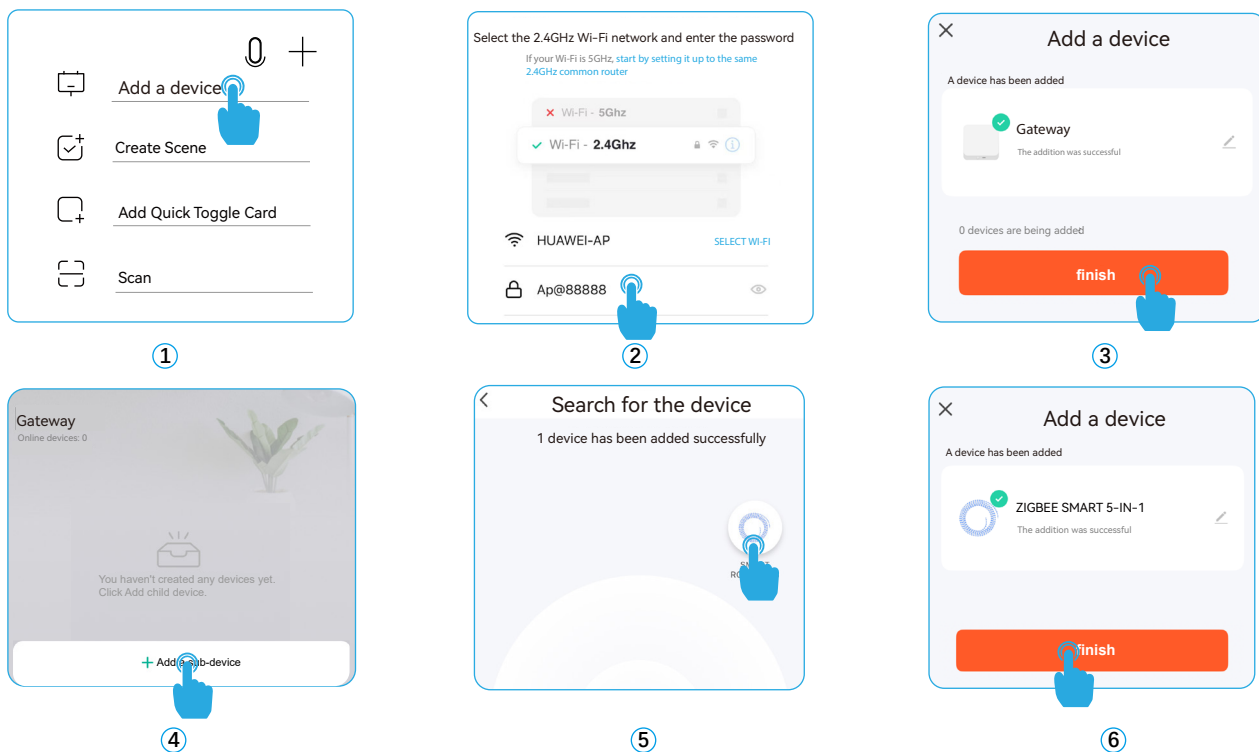




### MC408Z-ZIGBEE connection to TUYA APP process

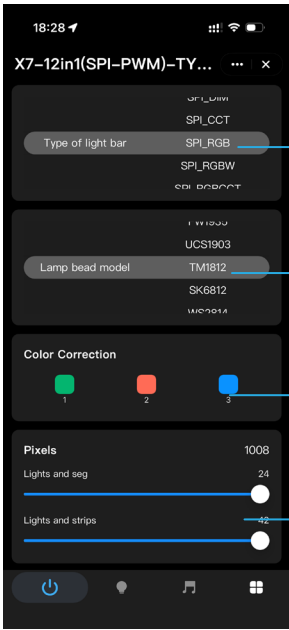
1. Make sure your smartphone is working under a WLAN network.
2. Open the Tuya APP, select Manually Add Gateway Central Control, select Zigbee Gateway, and enter the WIFI password to connect (Incorrect WIFI password will cause the connection to fail, non-2.4G network WIFI also.)
3. Reset the Zigbee gateway device, the red and blue lights of the Zigbee gateway are always on, turn on the power supply, please confirm that the red light is flashing, the blue light is always on, and the red light is always on after the connection is successful.
4. Click Done to enter the gateway control interface, add sub-devices, and confirm that the sub-devices belong to the network configuration mode (please place the gateway, controller, and smartphone close to each other for quick speed.)
- Pairing identification) long press the controller "ON/OFF" for 5 seconds, after the connection is successful, the sub-device will be displayed on the home page, then tap the device and enter the control interface to do more.
5. After the controller is installed in the APP, we can easily control the LED lighting with the APP.

Follow these steps to complete the connection:



Set light type

The MC408X is a 12-in-1 LED controller that's compatible with 12 different types of lights. To make sure your lights work properly, please adjust the settings according to the type of lights you're using.



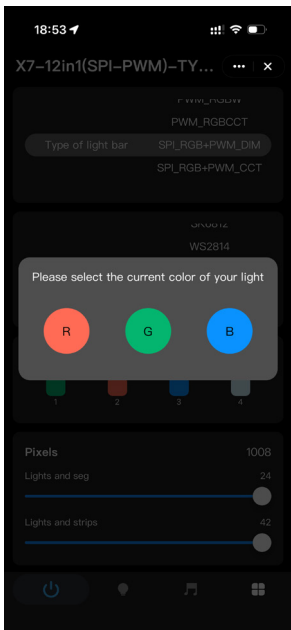
Parameter Settings Page

Choose 12 different types of lamps:  
PWM DIM、PWM CCT、PWM RGB、  
PWM RGBW、PWM RGB+CCT、  
SPI DIM、SPI CCT、SPI RGB、  
SPI RGBW、SPI RGB+CCT、  
SPI RGB+PWM DIM、  
SPI RGB+PWM CCT;

Select the lamp model:  
Choose the IC according to the driver IC  
used by the lamp.  
This sub-option is only available for lamps  
with IC drivers.

Color correction;

Set the number of segments and  
LEDs on the light strip;

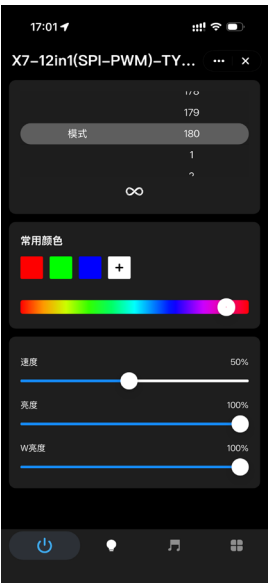


Color Calibration Page

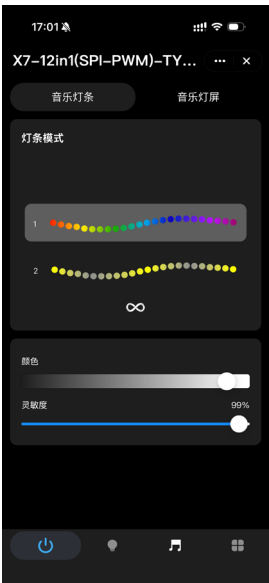
**Purpose of color calibration:** To ensure that the controller commands match the actual color displayed by the lighting fixture. Enter the color calibration interface;  
In the color calibration interface, select the corresponding color button according to the actual color displayed by the lighting fixture. For example, if the lighting fixture actually displays red light, select the red button, and continue selecting all the color buttons in sequence.  
The calibration interface will automatically adapt based on the selected lighting fixture type, providing intuitive calibration options. For example, RGB+CCT-type fixtures display five colors, while RGB-type fixtures display three colors, ensuring that users can quickly and accurately adjust colors.

App Control Interface

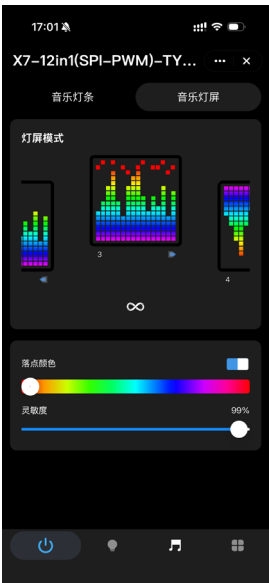
After the user completes the selection of the light fixture type and color calibration, they will automatically enter the adaptive control interface. The app can intelligently recognize the chosen light fixture type and provide corresponding control options based on the fixture's features. For example, for SPI RGB PWM DIM type fixtures, the main controller interface is displayed:



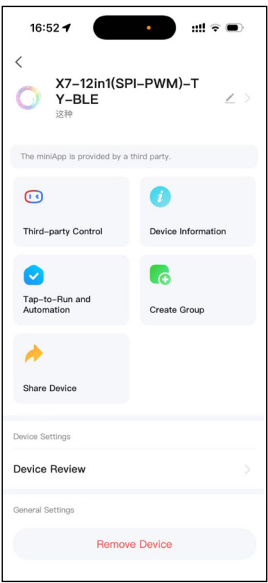
Color Settings



Light strip mode



Light Screen Mode



Settings

**Color Settings:** Equipped with 180 controller modes and loops, offering a variety of preset lighting effects (such as breathing, flowing, gradient, etc.), allowing users to switch between different dynamic effects. It provides red, green, and blue shortcut buttons as well as a custom color addition feature, with a full-spectrum slider below to support precise color adjustment. Edit the LED light's color, speed, and brightness... to control the rate of change of lighting effects and the overall output brightness separately.

**LED strip mode:** Divide the LED strip into multiple independently controlled segments, each segment can be set with different music effects, points, and audio ranges.

**Light screen mode:** You can choose the mode and set parameters like drop color and sound column color

**Settings:** If you need to change any initial configurations, the settings interface clearly marks all configuration entries, making it easy for you to adjust at any time. Besides that, in the settings interface, you can also change the device name, schedule power on/off, set power on/off effects, perform OTA upgrades, and set the startup state.

## Safety Precautions

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1. The remote control is a precision electronic product, please do not use it in a humid or high temperature environment for a long time. If not in use for a long time, remove the battery and store it in a cool, dry place.
2. Do not use this device in a large area of metal or in an environment with strong electromagnetic waves nearby, otherwise it will seriously affect the control distance
3. Please check whether the input voltage of the constant voltage power supply meets the requirements of the controller, and check whether the connection of the cathode and anode is correct.
4. The working voltage is DC 12~48V, if the voltage is higher than 48V, the controller will be damaged.
5. Non-professional users cannot directly disassemble the controller, otherwise it may cause fire and electric shock.
6. The working temperature (Ta) is -20~60°C; Do not use the device in direct sunlight, humidity, or other high-temperature areas.
7. When the equipment load reaches 15A, the wire diameter must be more than 1.5 square millimeters
8. When the device load exceeds 10A, the connection cable from the DC port to the LED strip must be shorter than 40cm.
9. Please install the device in a good heat dissipation area.