# ESP32-MeshKit-Light

## User Guide

Version 1.1

Espressif Systems

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# About This Guide

This document introduces the ESP32-MeshKit-Light, focusing on specifications, features, handling, etc.

## Release Notes

| Date | Version | Release notes |
|---|---|---|
| 2018.07 | V1.0 | Initial release. |
| 2018.08 | V1.1 | • Deleted description of HomeKit in Chapter 5;<br>• Update document cover. |

## Documentation Change Notification

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## Certification

**Download certificates for Espressif products from *here*.**

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# 1. Overview

With the development of the Internet of Things, the need for smarter and easy-to-use network for multiple devices is rapidly expanding. Traditional scenario of wireless networking consists of a point-to-point or point-to-multipoint star topology. All client nodes must be connected to the hub (router) in order to communicate with each other, which leads to the following problems:

- Limited network capacity: the hub (router) can be directly connected to 10 devices at most.
- Limited network coverage: all terminal nodes must be located within the Wi-Fi coverage of the central node, making the networking scenario inappropriate for large venues or places with multiple layers.

To meet the growing needs for wireless networking for the Internet of Things, Espressif introduces the ESP Mesh wireless networking technology. Different from traditional wireless networking, ESP-MESH nodes can dynamically talk to each other, and self-organize into a tree network to share network connection across a large area.

ESP32-MeshKit-Lights are smart lights based on ESP Mesh, with which developers can get familiar with the features of ESP Mesh and do further development.

# 2. Warnings and Cautions

- These bulbs are not suitable for use with dimmers.
- Please keep the light bulbs away from liquids and humid environments.
- The product is for indoor use only. Also, do not use it in a wet environment, such as a bathroom.
- Before removing a light bulb from its socket, power off the light to avoid any electric shocks, and let it cool down to avoid any burns.
- The product is not a toy and should not be used by children.
- Do not place the product on hot surfaces.
- The product must never be dismantled due to health and safety risks.

# 3. User Guide

Please follow steps below to get started with ESP32-MeshKit-Lights.

1. Power your light sources.
2. Download the ESP-Mesh APP for Android by scanning the QR code below.

3. Enjoy your lighting system.

> 📖 ***Note:***
>
> *For more information about ESP32-MeshKit-Light or secondary development on the ESP32 MeshKit Smart Light, please go to ESP-MDF.*

# 4. Product Specifications

## 4.1. Basic Specifications

| | |
|---|---|
| Product name | ESP32-MeshKit-Light |
| Product Type | BLC0802WM |
| Input power supply | AC100-240V, 50/60 Hz |
| Rated power | 9W |
| Power factor | > 0.9 |
| Lumen output | (1) 2700-6500K: 806lm ±10%;<br>(2) RGB: R/15-20lm, G/75-80lm, B/15-20lm |
| Color rendering index | Ra > 80 |
| Diameter | 60 mm/2.36 inch |
| Height | 118 mm/4.65 inch |
| Screw in Light Bulb Base | E27 |

## 4.2. Wireless Specification

| | |
|---|---|
| Wireless frequency band | 2.4 GHz |
| Wireless communication protocol | IEEE 802.11 b/g/n |
| Wireless channels | Channels 1-14 (The actual channel used is subject to different national standards in different countries.) |
| Transfer rate | 1-200 Kbps |

## 4.3. Environmental Parameters

| | |
|---|---|
| Operating temperature | -20 ~ 40°C |
| Storage temperature | -40 ~ 85°C |
| Storage humidity | 10% < H <90% (non condensing) |
| Operational humidity | 10% < H <85% (non condensing) |

## 4.4. Certification

| | |
|---|---|
| CE EN50550 | Yes |
| RoSH/Reach/ERP | Yes |
| PSE | Yes |
| TELEC | Yes |

# 5. Product Features

## 5.1. ESP-Mesh

- Self-organizing: support for simultaneous network configuration and node networking;
- Self-expanding: once allowed, new client devices are automatically guided to connect to the best available AP;
- Self-managing: no routers required for the normal operation of a mesh device since each mesh device serves as an AP and server at the same time;
- Self-balancing: dynamic routing based on node traffic load, which ensures the optimal path for data transmission;
- Dynamic communication: any two nodes in a mesh topology can communicate with each other, allowing for easy packet return.

## 5.2. Wi-Fi Support

- Extended coverage: up to 100 meters for a hop between two nodes in the mesh network;
- Great capability: up to 1000 nodes are allowed to connect to each other in a mesh network;
- High bandwidth: up to 10 Mbps of data transfer rate;
- Support for Wi-Fi sniffer.

> 📖 ***Note:***
>
> *The speed of networking is subject to the actual network conditions.*

## 5.3. Bluetooth Support

- Support for controlling mesh devices directly via Bluetooth on mobile apps;
- Support for access to Bluetooth devices;
- Support for Bluetooth Sniffer.

## 5.4. Low Power Consumption

- Low power consumption: support for ultra-low-power sleep mode.

## 5.5. Robustness

- Self-healing: the mesh network can automatically overcome individual node failures;
- Fast networking: support for networking of 50 devices in 20 seconds;
- Support for Wi-Fi security encryption;

- Support for fast OTA upgrade.

## 5.6. User Experience

- Simple operation: One-step configuration and networking.

## 5.7. Reliability

- No need to configure a dedicated gateway;
- No need to configure cloud server, support for both cloud and local control.

# 6. Warranty

The product offers a two-year warranty. This is valid only when the product is used in accordance with its purpose and the instructions provided. To claim a reimbursement within the warranty period, please provide us with the original purchase records (invoice or receipt), highlighting the date of purchase and the retailer's purchase description. The above warranty shall not apply, if any defects or damages arise from:

- Changes, smears, deletions, or unintelligible handwriting on receipts or product description.
- Improper use or neglect.
- Exposure to extreme circumstances, such as lightning, excessive humidity, flooding, etc.
- Other unforeseen operating circumstances of the Force Majeure.

# 7. Product Handling

## 7.1. Cleaning and Maintenance

Do not clean the product when it is connected to a power source. To avoid scratching, clean the product with a soft and dry cloth. Do not use any detergents.

## 7.2. Disposal of Waste Products

This product is designed and manufactured using high-performance and recyclable materials.

If there is a sticker on the product, showing a crossed-out wheelie bin, as the figure below shows, this indicates that the product must not be disposed of along with general refuse. This complies with the EU's Directive about the Waste of Electrical and Electronic Equipment (WEEE) 2002/96/EC, regarding the proper treatment and recycling of electronics.

Please learn about the policies in your area/country, regarding the proper treatment and disposal of electronics and electrical products.

Please follow local regulations and do not dispose of electronics or electrical equipment along with general waste. Proper treatment and disposal of such products conduces to avoiding environmental and health risks.

Espressif hereby declares that the ESP32-MeshKit-Light complies with the requirements of the 2002/96/EC and 1999/5/EC directives and other related regulations. For details, please go to Espressif's Official Website.

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