



M117 Series WIFI Smart Plug

Product Specification

Version V1.0

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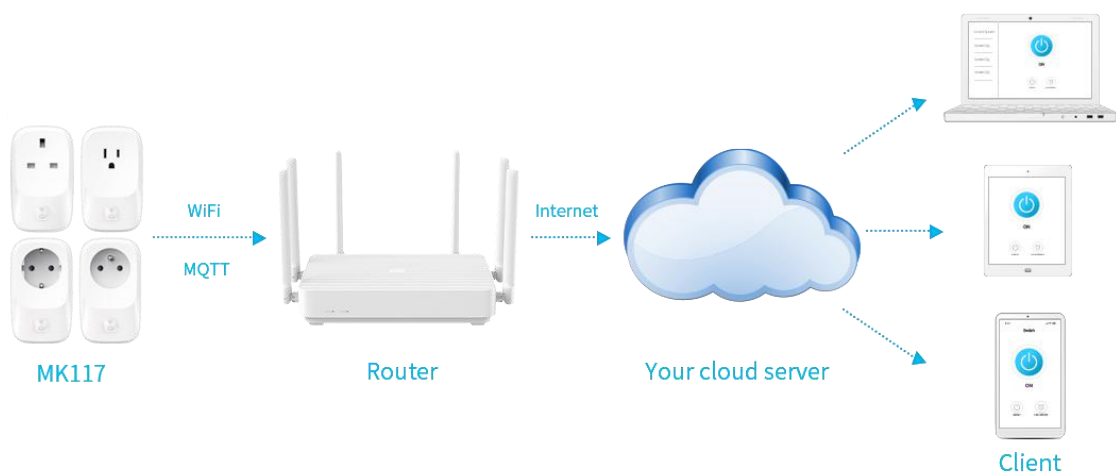
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1. Introduction

1.1 Overview

MK117 Series product is a WIFI smart plug with power and energy monitoring, the measuring accuracy is $\pm 0.5\%$. The plug can connect to your cloud server through the WIFI network, so as to realize smart control, power and energy monitoring and other functions.

MK117 supports connecting to standard MQTT broker (such as EMQTT, Mosquitto and etc,) and other servers that support MQTT protocol. It can also work with AWS IOT and Aliyun IOT, can be quickly integrated to your existing IOT system, all data will be upload directly to your server, which is convenient for your further applications development.



1.2 Model List

MK117 series contains several product models, the model list is as below:

| Band | Model | Description |
|---------------|-----------|-----------------------------|
| 2.4GHz | MK117- B | US type, max current is 15A |
| | MK117- G | UK type, max current is 13A |
| | MK117- F | EU type, max current is 16A |
| | MK117- E | FR type, max current is 16A |
| 2.4Ghz&5.0GHz | MK117D- B | US type, max current is 15A |
| | MK117D- G | UK type, max current is 13A |
| | MK117D- F | EU type, max current is 16A |
| | MK117D- E | FR type, max current is 16A |

2. Features

- Supports connecting to customer's own server
- Real-time voltage, current and active power monitoring with $\pm 0.5\%$ measuring accuracy
- Track the daily/monthly/historical total energy consumption and locally record energy data
- Support multiple protections, minimize the electricity risk
- Equipped with two LED indicators, device status is more intuitive and visible
- Device parameters can be flexibly modified by user APP
- FCC&UL&CE&UKCA certified

3. Application

Scenario 1: Smart home / building energy solution

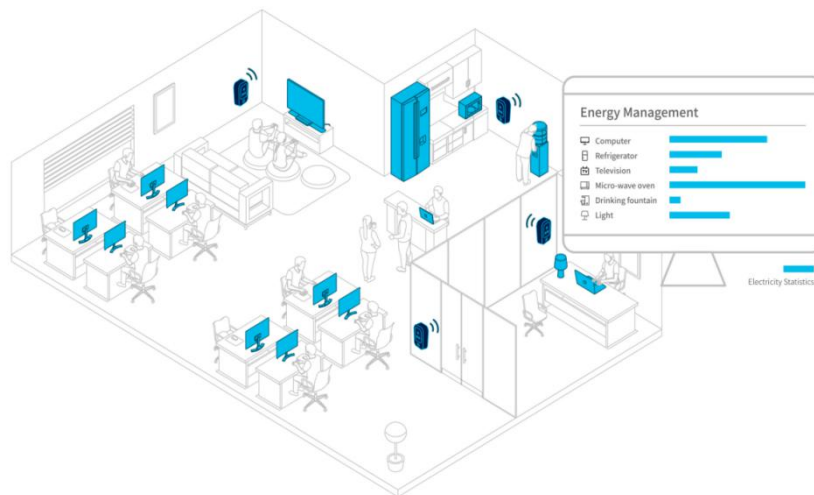
Deploy the plug in homes or buildings. For home users, the smart plug provides users with a simple way to manage home electrical equipment and control the switch of electrical appliances at any time. It also helps users fully understand their daily energy usage, analyzes inefficient and aging electrical appliances through intuitive energy data, which can effectively save energy and reduce household electricity bills.

For public places usage, the plug provides users with a simple and effective way to centrally manage multiple electrical devices. And convert the real-time data of energy consumption into accurate billing data and supply and demand balance ability.



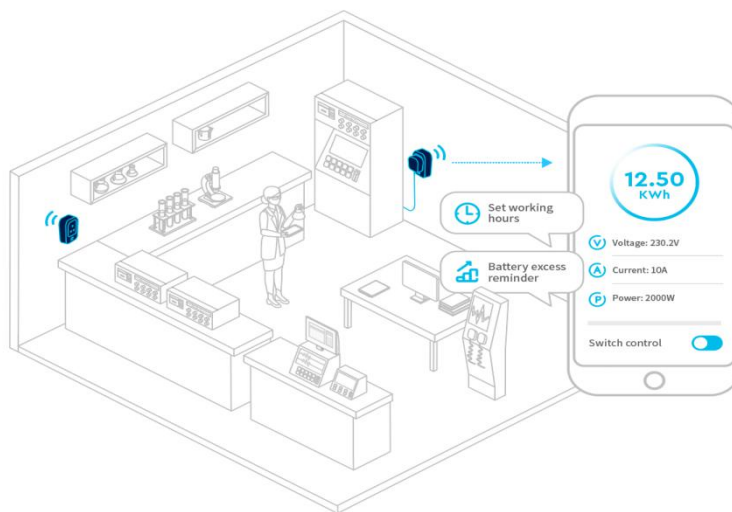
Scenario 2: Smart office energy solution

MOKO smart plug provides a safe and reliable way to implement a variety of smart functions (such as remote control, countdown switch, power monitoring) in the daily office space, users can set the working status and running time of the equipment through the server/APP. Devices can be easily managed and monitored, and billing data can be tracked in real time so that users can properly gauge energy usage.



Scenario 3: Smart Lab energy tracking

Deploy the plug in the laboratory to supply power to the electrical equipment. The plug can monitor the power consumption data of electrical appliances in real time and upload the data to the server. Users can monitor and remotely control the plugs in any time, and make billing analysis and energy management solutions based on the power data reported by the plug. It helps lab manager easily control electrical equipment to turn off during non-working hours to reduce unnecessary power consumption, and find out the equipment that consumes excessive power due to aging.



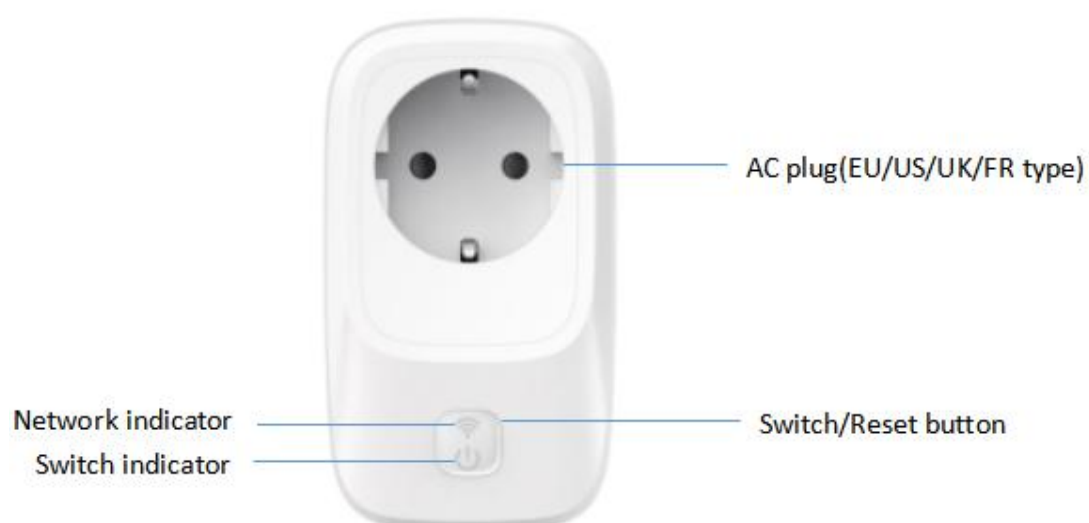
Scenario 4: Solar system energy metering

Deploy the plug in your solar system. The plug can measure the instant power, voltage and current of the electricity generated by the solar system, then uploads the real-time data to your server. The daily/month/year electricity can be calculated, you can easily know how much the clean energy it creates and how much the bills you save.

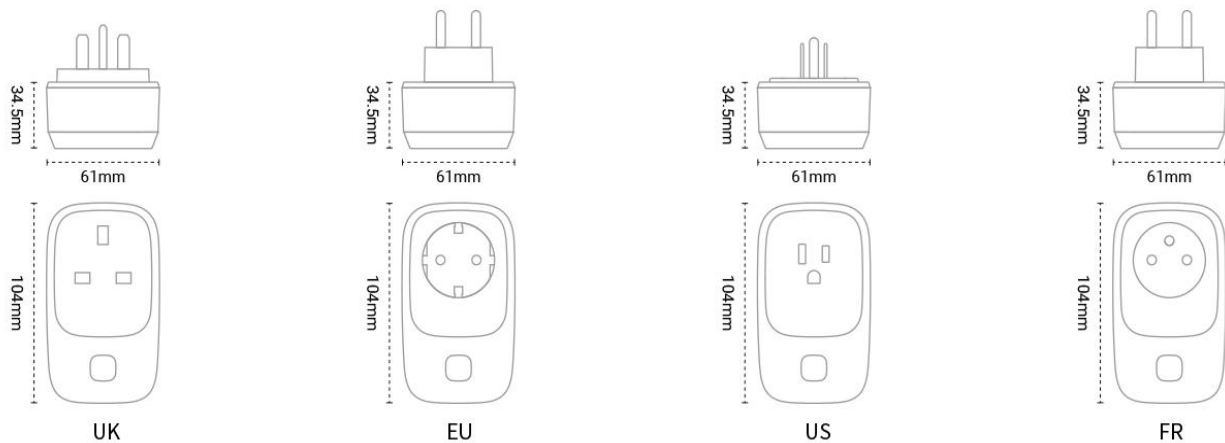


4. Product Appearance



4.1 Appearance



4.2 Dimensions



4.3 LED Patterns

| Indicator | Action | LED Patterns |
|---|---|--|
|  | AP mode, the plug works as a WIFI hotspot | Flash yellow |
| | Connecting to the router and server | Flash blue |
| | Connected to the server successfully | Solid blue |
|  | Switch ON | The color depends on the active power consumed by the load |
| | Switch OFF | LED OFF |
| | Restore to factory setting | Flash blue and yellow once |
| | Reset energy memory | Triple flash white light |
| | Overload/voltage/current protection | Flash red once per second |
| | OTA process | Flash blue |
| | OTA succeed | Solid blue |
| | OTA failed | Solid red |

5. Product Specification

| Electronic | |
|--------------|---------------------|
| Plug type | US/UK/EU/FR |
| Power supply | 100-240VAC, 50/60Hz |

| | |
|-----------------------|---|
| Output capacity | US type: 15A UK type: 13A EU/FR type: 16A |
| Button | 1* button |
| LED indicator | 2*RGB indicators |
| Physical | |
| Material | ABS+PC |
| Color | White |
| Dimension | 104mm*61mm*34.5mm |
| Environment | |
| Operating temperature | 0 °C~ 40 °C |
| Operating humidity | 0%~95% (No condensation) |
| Storage temperature | -10 °C~ 50 °C |
| Communication | |
| Protocol | MQTT V3.1.1 |
| Encryption | TCP/SSL |
| Data format | JSON |
| WIFI | |
| Bandwidth | MK117: 2.4GHz MK117D: 2.4GHz/5GHz |
| Protocol | MK117: 802.11 b/g/n MK117D: 802.11 a/b/g/n |
| Security | OPEN/WEP/WPA_PSK/WPA2_PSK/WPA_WPA2_PSK |
| Antenna | Onboard antenna |

6. Main Functions

6.1 Connection With Customer Server

The server information is configurable, it supports connecting to customer's own server. Users can quickly configure the server information with MOKO APP.

The gateway supports connecting to standard MQTT brokers (such as EMQTT, Mosquitto) and other servers that support MQTT protocol, it can also work with AWS iot and Aliyun iot.

6.2 ON/OFF Control

There are two ways to control the AC output of the plug:

- By the physical button, click the button once to switch the ON/OFF state.
- By MQTT command. After the plug is successfully connected to the server, users can send a MQTT command through the server/app to remotely control the switch status.

6.3 Timer

After the plug is successfully connected to the server, users can set a countdown switch for the plug through MQTT command. When the timer is complete, the plug will automatically change the switch status.

6.4 Power Monitoring

The plug can measure the instant voltage, current, active power and power factor of the connected load, and the measuring accuracy can reach $\pm 0.5\%$.

After the plug is connected to the server, users can view the real-time consumption data on the server/app.

6.5 Energy Monitoring

The plug can record daily/monthly/historical total energy data locally, and the measuring accuracy is also $\pm 0.5\%$.

After the plug is connected to the server, users can visually get the energy data on the server/app.

6.6 Power Consumption Indication

The bottom indicator (power indicator) can change its color according to the active power of the connected loads. The different colors of the indicator represent different power levels, which is convenient for users to intuitively and quickly capture the changes in load power.

6.7 Multiple Protections

The plug supports multiple protections. When it detects the measured voltage/current/power out of the safe range, the plug will automatically turn off, and the indicator will flash red.

- Overvoltage protection: When the plug detects that the measured voltage exceeds the voltage threshold for a period of time, it will automatically turn off.
- Overcurrent protection: When the plug detects that the measured current exceeds the current threshold for a period of time, it will automatically turn off.
- Overload protection: When the plug detects that the measured power exceeds the power threshold for a period of time, it will automatically turn off.

6.8 Load Work State Detection

When the plug detects that the load starts/stops working, it will immediately report a notification

to the server. Users can receive the notification on the APP/server and know the working status of the load at any time.

6.9 OTA

The plug has the ability to upgrade firmware over the air. MOKO can provide the latest firmware upgrade file with customers for their further test.

6.10 Restore to Factory Settings

There are two ways to restore the plug to factory settings:

- By the physical button: press and hold the button for 10 seconds, the plug will restore to factory setting, then it will enter AP mode.
- By MQTT command: After the plug is successfully connected to the server, users can send a MQTT command through the server/app to restore the plug to factory settings.

7. Development Document


MOKO provides the following documents for customers to test products and develop their own firmware/APP, and supports to flash custom firmware during production.

| File | Version | Description |
|---|---------|---|
| <i>MK117 Series Product Specification</i> | V1.0 | This document mainly introduces MK117 series product. |
| <i>User Manual</i> | V1.0 | This document instructs users how to configure the plug with MOKO APP and manage the plug on the server/APP. |
| <i>Communication Protocol</i> | V1.0 | This document describes the configuring commands and management commands supported on MK117 series product. |
| <i>APP SDK</i> | V1.0 | iOS: https://github.com/MokoLifeX/MokoLifeX_iOS Android: https://github.com/MokoLifeX/MokoLifeX_Android.git The APP SDK includes the source code of the MokolifeX APP. Customers can quickly develop their own APP with it. |
| <i>Development Document</i> | V1.0 | The document includes the schematic diagram and test points related to firmware development and download. With this document, customers can develop their own firmware and download the firmware to the MOKO hardware. |
| <i>Power metering SDK</i> | V1.0 | https://github.com/RN8209C/RN8209C-SDK Power metering SDK contains the source code used for the power metering chip, customer can integrate it into their own firmware directly to reduce the development time. |

8. Revision History

| Revision | Description | Editor | Date |
|----------|---------------------------------------|-----------|-----------|
| V1.0 | Initial Version | Weiguifen | 2021.8.28 |
| V1.1 | Add description of the series models. | Weiguifen | 2022.4.1 |

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