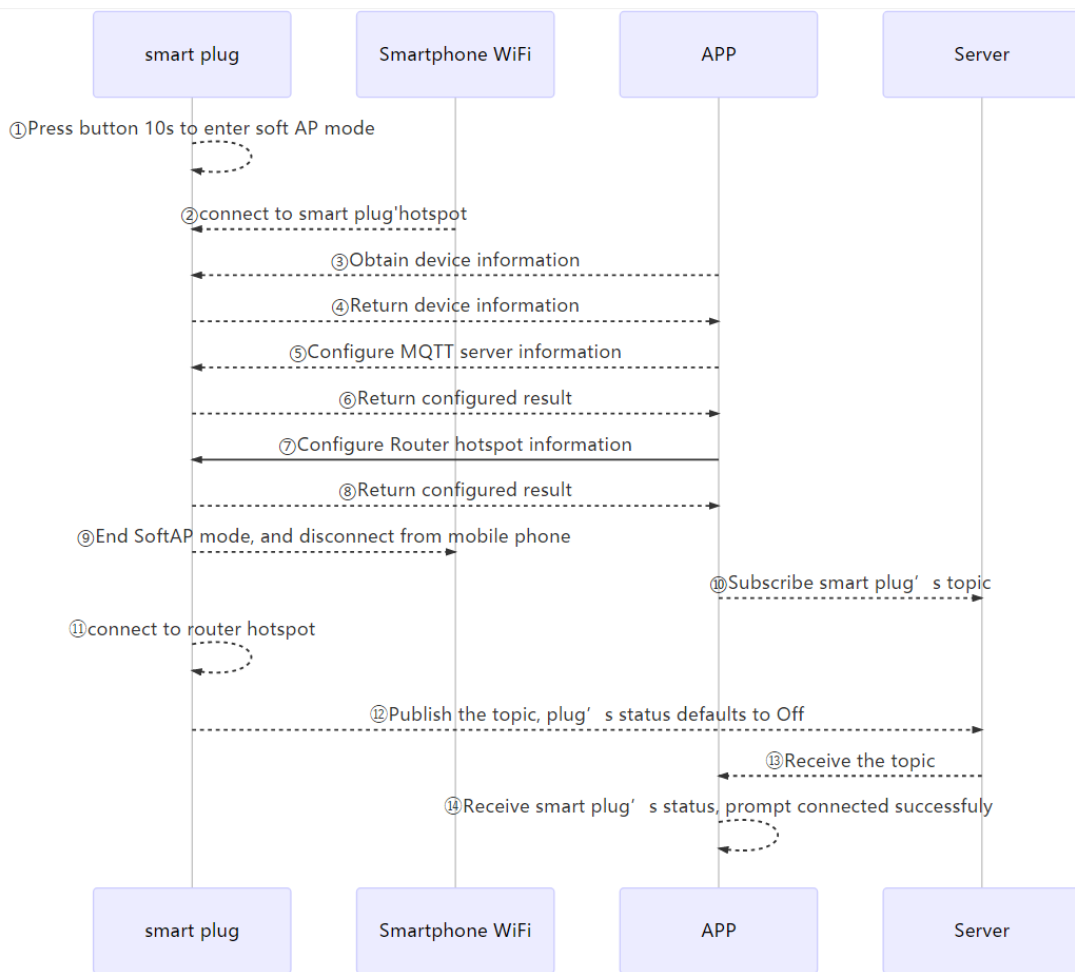


MK102 MK112 V1 MQTT protocol

Version	Revision record
1.0	Initial version
1.1	Add two MQTT topics: 1. Device remove; 2. Power consumption
1.2	Supplement the specification of MQTT parameter
1.3	Considerations for supplementing OTA functionality
1.4	Add publish on-off status rules
1.5	Modify heartbeat packet time

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Work Processes



Note: In AP mode, which means the smart plug is the TCP sever. IP: 192.168.4.1
Port: 8266

1. Description of error messages during communication between Smartphone and smart plug

Code No.	Message Notification
0	Information successfully received and parsed
1	The length does not meet the requirements
2	Data type does not meet the requirements
3	The order of MQTT information configuration and wifi network information configuration does not meet the requirements
4	Received data does not conform to JSON format
5	Received JSON data not defined by the document
6	The data type is right, but the value is out of range

2. Smartphone sends data to smart plug

2.1 SmartPhone requests the device information of smart plug

Function Description:

When Smartphone successfully connected to smart plug' s hotspot, APP will request the device information of smart plug .

Sent by Smartphone

Name of parameter	Type	Description
Header	Number	/

```
{  
    "header" : 4001  
}
```

Response from smart plug

Name of parameter	Type	Description
Code	Number	0: represents success, non-0: indicates data error
Message	String	Code supplementary instructions
Result	Object	/
Header	Number	/
Device_function	String	Function of the device
Device_name	String	Name of the device
Device_specifications	String	Specification, CN/US/UK/EU
Device_mac	String	MAC address for smart plug, as the only identification of smart plug
Device_type	String	Used to distinguish between smart plug functions. value "0" : without power monitoring function; value "1" : With power monitoring function

```

{
  "code" : 0,
  "message" : "success",
  "result" : {
    "header" : 4001,
    "device_function" : "iot_plug",
    "device_name" : "plug_one",
    "device_specifications" : "us",
    "device_mac" : "11:22:33:44:55:66",
    "device_type" : "1"
  }
}

```

Note:

-More return code and message, please check the description of error messages during communication between Smartphone and smart plug

2.2 Smartphone sends MQTT server information to smart plug

Function Description:

When the smartphone successfully connected to the smart plug's hotspot, the Smartphone will send the MQTT server information to the plug. If the plug receives this information and successfully parses it, and plug successfully connects to the WiFi network, the plug will automatically connect to the MQTT server specified by the Smartphone.

Sent by Smartphone

Name of parameter	Type	Description
header	number	/
host	string	The IP or domain name of MQTT server host ip, it should be 1~64 bytes and cannot be empty
port	number	The port number of MQTT server host , the range is 0~65535
connect_mode	number	Connection mode 0: TCP ; 1: SSL
username	string	Length is 1~32 bytes, can not be empty
password	string	Length is 1~32 bytes, can not be empty

Name of parameter	Type	Description
keepalive	number	heartbeat package time, the range is 60~120, and unit is "s"
qos	number	Value range: 0~2; QoS 0 – at most once; QoS 1 – at least once; QoS 2 – exactly once
clean_session	number	Value range: 0~1; When the clean session=1, the client does not want a persistent session. If the client disconnects for any reason, all information and messages that are queued from a previous persistent session are lost; when the clean session=0, the broker creates a persistent session for the client. All information and messages are preserved until the next time that the client requests a clean session. If the clean session flag is set to false and the broker already has a session available for the client, it uses the existing session and delivers previously queued messages to the client..

```

{
    "header" : 4002,
    "host" : "45.32.33.42",
    "port" : 1883,
    "connect_mode" : 0,
    "username" : "DVES_USER",
    "password" : "DVES_PASS",
    "keepalive" : 120,
    "qos" : 2,
    "clean_session":1
}

```

Response from Smart plug

```

{
  "code" : 0,
  "message" : "success",
  "result" : {
    "header" : 4002
  }
}

```

Note

- More return code and message, please check the description of error messages during communication between Smartphone and smart plug

2.3 Smart plug connects specific ssid WiFi network which provided by Smartphone

Function Description:

Smartphone provides a connectable router information to the plug. After the plug obtains the router information, the plug will automatically connect to the specified router. After connected the router, the plug will automatically connect to the MQTT server.

Sent by Smartphone

Name of parameter	Type	Description
header	number	/
wifi_ssid	string	non-empty
wifi_pwd	string	
wifi_security	number	Value: OPEN=0,WEP=1,WPA_PSK=2,WPA2_PSK=3,WPA_WPA

```

{
  "header" : 4003,
  "wifi_ssid" : "Fitpolo",
  "wifi_pwd" : "fitpolo1234.",
  "wifi_security" : 3
}

```

Response from smart plug

```
{
  "code" : 0,
  "message" : "success",
  "result" : {
    "header" : 4003
  }
}
```

Note

- More return code and message, please check the description of error messages during communication between Smartphone and smart plug

3.The communication between smart plug with MQTT server

MQTT classifies messages by topics and is essentially a string.

In MQTT, If subscribe to a topic, each subscriber will receive related topic information.

For example:

The APP subscribes a topic, and when smart plug publishes this topic, APP can receive this topic information.

The smart plug subscribes a topic. When the APP publishes this topic, the smart plug can receive this topic information.

3.1 Topic format description in MQTT protocol

Topic: Device Function / Device Name / Model / mac / client / Function Field

	Description
Device Function	Used to distinguish smart plug(iot_plug), smart switch(iot_switch)...
Device Name	Used to distinguish different types of the smart plug, such as: plug_one
Model	CN/US/UK/EU
mac	Mac address of WiFi chip
client	Used to distinguish APP and plug

	Description
Function Field	Indicates different topic function

Among them, the device information includes Device function / device name / model / mac / is provided by the smart plug. When the Smartphone is successfully connected to the plug, and send device information request to the smart plug , the smart will send the device information to the Smartphone

For example::

Topics published by smart plug (topic):

topic:iot_plug/plug_one/us/mac/device/ Function Field

Topics published by APP (topic):

topic:iot_plug/plug_one/us/mac/app/ Function Field

3.2 MQTT topics published by smart plug

3.2.1 On-off status

topic:iot_plug/plug_one/us/mac/device/switch_state

Function Description:

With this topic, the plug publish the current on-off status of the plug to the server.

Everytime the smart plug is just connected to the MQTT server, it will publish this topic;

When the on-off status of the smart plug changes, it will publish this topic.

Regardless of whether the on-off status of the plug changes, it will publish this topic at a regular time (the interval is 30s by default)

Name of parameter	Type	Description
switch_state	string	Value:" on" , "off"

```
{
  "switch_state" : "on"
}
```

3.2.2 Device information

topic:iot_plug/plug_one/us/mac/device/firmware_infor

Function Description:

With this topic, the smart plug publish device information to the server.

Name of parameter	Type	Description
company_name	string	Name of the Company

Name of parameter	Type	Description
production_date	string	Date of Production
product_model	string	Name of the Device
firmware_version	string	Version of the Firmware
device_mac	string	Mac address of smart plug

```

{
    "company_name" : "moko",
    "production_date" : "201801",
    "product_model" : "plug_one",
    "firmware_version" : "000001"
    "device_mac" : "11:22:33:44:55:66"
}

```

3.2.3 Countdown

topic:iot_plug/plug_one/us/mac/device/delay_time

Function Description:

With this topic, the smart plug sends the remaining time for the plug's countdown to the server, and the state in which the plug will switchover. Once Smart plug publish this topic, it will start to send the topic information to the server every second until the countdown is completed (that is, the countdown time is 0).

Before the smart plug countdown starts but is not completed, the following actions will cancel the countdown in advance. And then the smart plug will not publish the topic information to the server.

1. In the countdown process. If the plug on-off status changes, it will cancel the countdown in advance.
2. In the countdown process. If the input of plug is powered off and then on, and the countdown will also be canceled.
3. If during the countdown process, the plug receives the topic of countdown published by APP again, the plug will cancel the countdown in advance and go to the next round of the countdown.

Note: It needs MQTT server to implement together.

Name of parameter	Type	Description
delay_hour	number	Range: 0~23
delay_minute	number	Range: 0~59
delay_second	number	Range: 0~59

Name of parameter	Type	Description
switch_state	string	Value:" on" , "off"

```

{
    "delay_hour" : 3,
    "delay_minute" : 3,
    "delay_second" : 59,
    "switch_state" : "off"
}

```

3.2.4 OTA upgrade status

topic:iot_plug/plug_one/us/mac/device/ota_upgrade_state

Function Description:

Name of parameter	Type	Description
ota_result	string	Value: "R1" "R2" "R3" "R4" ; R1: OTA successfully upgraded; R2: Connect to http server, but OTA upgrade fails; R3: After reconnecting several times, it is still not able to connect to http server; R4: Cannot find the corresponding IP address through the domain name

```

{
    "ota_result" : "R1"
}

```

3.2.5 Factory Reset

topic:iot_plug/plug_one/us/mac/device/delete_device

Function Description:

When the smart successfully connected to the mqtt server. and then press the button for 10 seconds to perform the reset operation, smart plug will publish this topic.

3.2.6 Power consumption

topic:iot_plug/plug_one/us/mac/device/electricity_information

Function Description:

After the socket is successfully connected to the mqtt server, the power consumption information will be published every second.

Note: It needs MQTT server to implement together.

Name of parameter	Type	Description
voltage	number	Current voltage (0.1V)
current	number	Current current (mA)
power	number	Current Power (W)

```
{  
  "voltage" : 2205,  
  "current" : 200,  
  "power" : 20  
}
```

3.3 MQTT topics subscribed by smart plug

When the smart plug connected to the specified mqtt server, smart plug will subscribe following topics by default.

3.3.1 Status of the smart plug

topic:iot_plug/plug_one/us/mac/app/switch_state

Function Description:

When the smart plug subscribe this topic and APP publish this topic, the smart plug will receive this topic information.

Name of parameter	Type	Description
switch_state	string	Value: "on" ," off"

```
{  
  "switch_state" : "on"  
}
```

3.3.2 Countdown

topic:iot_plug/plug_one/us/mac/app/delay_time

Function Description:

When the smart plug subscribe this topic and APP publish this topic, the smart plug will receive this topic information.

Key	Type	Description
delay_hour	number	Ranges: 0~23
delay_minute	number	Ranges: 0~59

```
{
    "delay_hour" : 3,
    "delay_minute" : 3
}
```

3.3.3 Factory reset

topic:iot_plug/plug_one/us/mac/app/reset

Function Description:

When the smart plug subscribe this topic and APP publish this topic, the smart plug will receive this topic information.

3.3.4 OTA information

topic:iot_plug/plug_one/us/mac/app/upgrade

Function Description:

When the smart plug subscribe this topic and APP publish this topic, the smart plug will receive this topic information.

Name of parameter	Type	Description
type	number	If the value is 0, it means ip address;if the value is 1, it means domain name
realm	string	The IP address or domain name of host which put the new firmware
port	number	Value: 0~65535
catalogue	string	The length should less than 100 bytes

Note: The IP address here must be a separate IP address, otherwise the upgrade will fail

For example:

The corresponding url of the new firmware:

http://23.83.237.116/smartplug/20180623/user2.1024.new.2.bin
(http://23.83.237.116/smartplug/20180623/user2.1024.new.2.bin)

```
{  
    "type" : 0,  
    "realm" : "23.83.237.116",  
    "port" : 80,  
    "catalogue" : "smartplug/20180623/"  
}
```

3.3.5 Firmware version

topic:iot_plug/plug_one/us/mac/app/read_firmware_infor

Function Description:

When the smart plug subscribe this topic and APP publish this topic, the smart plug will receive this topic information.

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