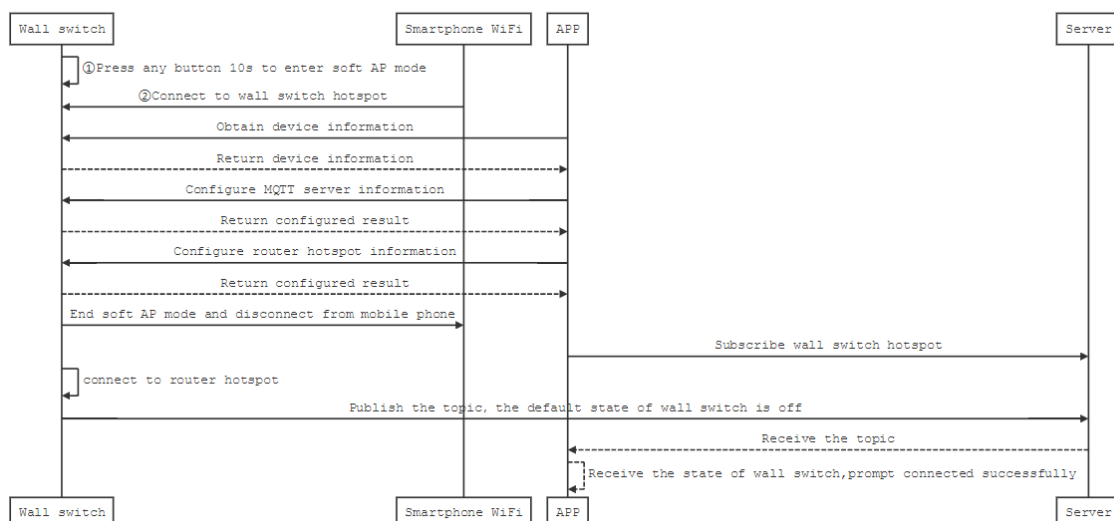


Wall switch MQTT protocol

Wall switch WS001-3

Version	Revision record
1.0	Initial version
1.1	Add countdown topic
1.2	Supplement function description

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Note: The wall switch in AP mode, which means the wall switch is the TCP server, IP:192.168.4.1, port:8266

1 Explanation of error message in communication between app and wall switch

code number	Explanation
0	Information was received successfully and resolved correctly
1	The length does not meet the requirements
2	The data type does not meet the requirements
3	The configuration order of mqtt information and wifi network information does not meet the requirements (send mqtt configuration information first, then send wifi network information)
4	The received data does not conform to the JSON format
5	Received JSON data not defined in the document
6	The data type is correct, but the value is out of the specified range

2 App send data to wall switch

2.1 SmartPhone requests the device information of wall switch

Function Description:

When Smartphone successfully connected to wall switch hotspot, APP will request the device information of wall switch.

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 wall switch, as the only identification of smart plug
device_type	string	Used to distinguish between wall switch functions, value " 1" :1 gang ;value " 2" :2 gang ;value " 3" :3 gang

```

{
  "code" : 0,
  "message" : "success",
  "result" : {
    "header" : 4001,
    "device_function" : "iot_wall_switch",
    "device_name" : "WS001-3",
    "device_specifications" : "eu",
    "device_mac" : "11:22:33:44:55:66",
    "device_type" : "3"
  }
}

```

Note: More return code and message, please check the description of error messages during communication between Smartphone and wall switch.

2.2 Smartphone sends MQTT server information to wall switch

Function Description:

When the smartphone successfully connected to the wall switch hotspot, the Smartphone will send the MQTT server information to the wall switch.If the plug

receives this information and successfully parses it, and the wall switch successfully connects to the WiFi network, the wall switch 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
keepalive	number	heartbeat package time, the range is 60~120, and unitis "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 sessio=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 Wall switch connects specific ssid WiFi network which provided by Smartphone

Function Description:

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

Sent by Smartphone

Name of parameter	Type	Description
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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 wall switch 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 wall switch publishes this topic, APP can receive this topic information.

The wall switch subscribes a topic. When the APP publishes this topic, the wall switch 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), wall switch (iot_wall_switch).....
Device Name	Used to distinguish different types of the wall switch, such as: 1 gang: WS001-1 , 2 gang: WS001-2, 3gang: WS001-3
Model	CN/US/UK/EU.....
mac	Mac address of WiFi chip
client	Used to distinguish APP and plug
Function Field	Indicates different topic function

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

For example::

Topics published by smart plug (topic):

topic:iot_wall_switch/WS001-3/eu/mac/device/Function Field

Topics published by APP (topic):

topic:iot_wall_switch/WS001-3/eu/mac/app/Function Field

3.2 MQTT topics published by wall switch

3.2.1 On-off status

topic:iot_wall_switch/WS001-3/eu/mac/device/switch_state

Function Description:

With this topic, the wall switch publishes the current on-off status of the switch to the server.

Everytime the wall switch is just connected to the MQTT server, it will publish this topic;

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

1 gang

Name of parameter	Type	Description
switch_state_01	string	Value: " on" ," off" .1 gang switch status

```
{  
    "switch_state_01" : "on"  
}
```

2 gang

Name of parameter	Type	Description
switch_state_01	string	Value: " on" ," off" .1 gang switch status
switch_state_02	string	Value: " on" ," off" .2 gang switch status

```
{  
    "switch_state_01" : "on",  
    "switch_state_02" : "off"  
}
```

3 gang

Name of parameter	Type	Description
switch_state_01	string	Value: " on" ," off" .1 gang switch status
switch_state_02	string	Value: " on" ," off" .2 gang switch status
switch_state_03	string	Value: " on" ," off" .3 gang switch status

```
{  
    "switch_state_01" : "on",  
    "switch_state_02" : "off",  
    "switch_state_03" : "off"  
}
```


3.2.2 Device information

topic:iot_wall_switch/WS001-3/eu/mac/device/firmware_infor

Function Description:

With this topic, the wall switch publish device information to the server.

When the wall switch receive the topic of reading the wall switch information then send this topic informationn.

Name of parameter	Type	Description
company_name	string	Name of the Company
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 wall switch

```
{
  "company_name" : "moko",
  "production_date" : "201801",
  "product_model" : "WS001-3",
  "firmware_version" : "000001"
  "device_mac" : "11:22:33:44:55:66"
}
```

3.2.3 Countdown

topic:iot_wall_switch/WS001-3/eu/mac/device/delay_time

Function Description:

With this topic,the wall switch sends the remaining time for the wall switch and the status of the wall switch to be switched to the server.

Wall switch subscribe the countdown topic,when the wall switch receive the countdown information from the mobile phone 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),then the wall switch will stop publish the countdown topic information.

Before the wall switch countdown start but not completed,the following actions will cancel the countdown in advance and the wall switch will stop publish the countdown topic information to the server.

1. In the countdown process, if the wall switch on-off status changes, it will cancel the countdown in advance.
2. In the countdown process, if the power input of wall switch turns off then turn on, the countdown will also be canceled.
3. In the countdown process, the wall switch receives the new countdown topic information, it will cancel current countdown then go to the next new round of countdown.

Note: It needs MQTT server to implement together.

1 gang

Name of parameter	Type	Description
delay_time_01	string	hour: minute: second , such as 1: 25:26 ,value range: hour: 0~23,minute: 0~59 ,second: 0~59

```
{
  "delay_time_01" : "1: 25:26"
}
```

2 gang

Name of parameter	Type	Description
delay_time_01	string	hour: minute: second , such as 1: 25:26 ,value range hour: 0~23,minute: 0~59 ,second: 0~59
delay_time_02	string	hour: minute: second , such as 2: 25:26 ,value range hour: 0~23,minute: 0~59 ,second: 0~59

```
{
  "delay_time_01" : "1: 25:26",
  "delay_time_02" : "2: 25:26"
}
```

3 gang

Name of parameter	Type	Description
delay_time_01	string	hour: minute: second ,such as 1: 25:26,value range hour: 0~23,minute: 0~59 ,second: 0~59
delay_time_02	string	hour: minute: second ,such as 2: 25:26,value range hour: 0~23,minute: 0~59 ,second: 0~59

Name of parameter	Type	Description
delay_time_03	string	hour: minute: second ,such as 3: 25:26,value range hour: 0~23,minute: 0~59 ,second: 0~59

```

{
    "delay_time_01" : "1: 25:26",
    "delay_time_02" : "2: 25:26",
    "delay_time_03" : "3: 25:26"
}

```

3.2.4 OTA upgrade status

topic:iot_wall_switch/WS001-3/eu/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_wall_switch/WS001-3/eu/mac/device/delete_device

Function Description:

When the smart successfully connected to the MQTT server, then press the button for 10 seconds to factory reset, wall switch will publish this factory reset topic.

APP: After receiving this topic information, app will remove the device with the corresponding MAC address.

Note:

1. The smart wall switch has the MQTT last will function enabled. After the wall switch is connected to the MQTT server, when the wall switch abnormally interrupts

the connection(such as network exceptions),and the last message will sent by MQTT server agent,that is the delete topic information.

2.The wall switch actively disconnects from the MQTT server,it will post a deleted topic,the message is empty.The wall switch unnormally interrupts the connect from MQTT server, a delete topic will sent by MQTT server,the message is { offline }.

3.3 MQTT topics subscribed by wall switch

When the wall switch connected to the specified MQTT server,wall switch will subscribe following topics by default.

3.3.1 Status of the wall switch

topic:iot_wall_switch/WS001-3/eu/mac/app/switch_state

Function Description:

When the wall switch subscribe this topic and APP publish this topic, the wall switch will receive this topic information.

1 gang

Name of parameter	Type	Description
switch_state_01	string	Value: "on" ," off"

```
{
  "switch_state_01" : "on"
}
```

2 gang

Name of parameter	Type	Description
switch_state_01	string	Value: "on" ," off"
switch_state_02	string	Value: "on" ," off"

```
{
  "switch_state_01" : "on",
  "switch_state_02" : "off"
}
```

3 gang

Name of parameter	Type	Description
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Name of parameter	Type	Description
switch_state_01	string	Value: "on" ," off"
switch_state_02	string	Value: "on" ," off"
switch_state_03	string	Value: "on" ," off"

```

{
    "switch_state_01" : "on",
    "switch_state_02" : "off",
    "switch_state_03" : "off"
}

```

3.3.2 Countdown

Function Description:

When the wall switch subscribe this topic and APP publish this topic,the wall switch will receive this topic information.

Key	Type	Description
delay_hour_xx	number	Value range : 0~23
delay_minute_xx	number	Value range : 0~59

1 gang countdown topic

topic:iot_wall_switch/WS001-3/eu/mac/app/delay_time_01

```

{
    "delay_hour_01" : 3,
    "delay_minute_01" : 3
}

```

2 gang countdown topic

topic:iot_wall_switch/WS001-3/eu/mac/app/delay_time_02

```

{
    "delay_hour_02" : 5,
    "delay_minute_02" : 26
}

```

3 gang countdown topic

topic:iot_wall_switch/WS001-3/eu/mac/app/delay_time_03

```
{
    "delay_hour_03" : 1,
    "delay_minute_03" : 46
}
```

3.3.3 Factory reset

topic:iot_wall_switch/WS001-3/eu/mac/app/reset

Function Description:

When the wall switch subscribe this topic and APP publish this topic, the wall switch will receive this topic information.

3.3.4 OTA information

topic:iot_wall_switch/WS001-3/eu/mac/app/upgrade

Function Description:

When the wall switch subscribe this topic and APP publish this topic, the wall switch will receive this topic information.

Name of parameter	Type	Description
type	number	Value: 0: ip address, 1: 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:

<http://23.83.237.116/WS001-3/user2.1024.new.2.bin>
(<http://23.83.237.116/WS001-3/user2.1024.new.2.bin>)

```
{  
    "type" : 0,  
    "realm" : "23.83.237.116",  
    "port" : 80,  
    "catalogue" : "WS002/"  
}
```

3.3.5 Firmware version

topic:iot_wall_switch/WS001-3/eu/mac/app/read_firmware_infor

Function Description:

When the wall switch subscribe this topic and APP publish this topic, the wall switch will receive this topic information.

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