

MQTT API DQ_HUB



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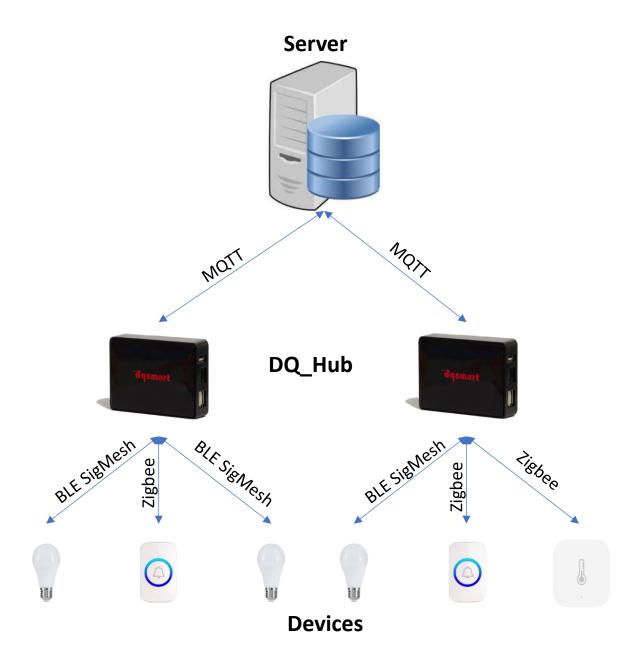
A. INTRODUCE

DQ_hub connect BLE SIGMESH device and ZIGBEE device to Server via Internet, using MQTT Protocol.

Hub feature:

- Control and monitoring BLE SigMesh device
 - + On/Off a light or group of lights
 - + Lightness a light or group of lights
 - + Change color a light or group of lights
 - + Call scene
 - + Save the light of state
 - + The light broken detected
- Control and monitoring Zigbee device
 - + On/Off a light
 - + Lightness a light
 - + Read status button
 - + Sensor (temperature, humidity, ...)
- Schedule a timer
- Auto run: control BLE SigMesh light using zigbee button or zigbee sensor
- Number of control devices is 120 (element + group)





B. API MQTT HUB

After successfully connecting to the server, the hub sends information to the server every 1 minute

Example Hub response message:

Topic: v1/devices/me/telemetry

Payload:

```
{
   "infor": {
      "ip": "172.16.26.112",
      "mac": "02:81:71:87:6d:f4",
      "id": "abc123",
      "version": "1.0.3",
      "name": "hub test 1"
   }
}
```

I. API MQTT HUB WITH BLE SigMesh

To send control commands to Hub, server public to topic:

v1/devices/me/rpc/request/\$request id

where \$request_id is an integer request identifier

To get feedback from Hub, server Subscribe to topic:

v1/devices/me/rpc/response/\$request id

1. Get list devices from hub

This command to get a list of devices managed by the hub Max devices is 120 (element + group)

Example message send to Hub:

Topic: v1/devices/me/rpc/request/\$request_id
Payload:

```
{
    "method": "get_list_device",
    "params": {
      "type": "ble_sigmesh"
    }
}
```

Example Hub response message:

Topic: v1/devices/me/rpc/response/\$request_id

```
"method": "list_device_status",
    "params": {
```

```
"type": "ble_sigmesh",
"nodes": [
  {
    "unicastAddress": "0004",
    "name": "TUBE V1.4",
    "type": "light"
  },
  {
    "unicastAddress": "0005",
    "name": "RFID reader",
    "type": "rfid reader"
  },
  {
    "unicastAddress": "0006",
    "name": "ENGERY TL",
    "type": "energy sensor"
  },
  {
    "unicastAddress": "0007",
    "name": "DQ SUSEN01SM 2021",
    "type": "vacancy_sensor"
  },
  {
    "unicastAddress": "000C",
    "name": "Motion TL",
    "type": "motion_sensor"
 }
```

- Name: name device
- Type: loại thiết bị (light, sensor,...)
- unicastAddress: device unicast address

2. Get list Group from hub

Example message send to Hub:

```
Topic: v1/devices/me/rpc/request/$request_id
Payload:
```

```
{
    "method": "get_list_groups",
    "params": {
      "type": "ble_sigmesh"
    }
}
```

Example Hub response message:

Topic: v1/devices/me/rpc/response/\$request id

Payload:

3. Get list Scene

Example message send to Hub:

Topic: v1/devices/me/rpc/request/\$request_id

Payload:

```
{
    "method": "get_list_scenes",
    "params": {
      "type": "ble_sigmesh"
    }
}
```

Example Hub response message:

Topic: v1/devices/me/rpc/response/\$request id

```
{
```

```
"method": "list_scenes_status",
"params": {
  "type": "ble_sigmesh",
  "scenes": [
    {
      "addresses": ["0005"],
      "name": "Scene 1",
      "number": "0001"
    },
    {
      "addresses": [],
      "name": "Scene 2",
      "number": "0002"
    },
      "addresses": [],
      "name": "Scene 3",
      "number": "0003"
```

4. Set On/Off device or group

Example message send to Hub:

```
{
    "method": "set_onOff",
    "params": {
        "type": "ble_sigmesh",
        "unicast": "0004",
        "value": 0
    }
}
```

- + unicast: unicast address of the device or group to be controlled
- + value: On = 1 or Off = 0

Example Hub response message:

Response received command from server

Topic: v1/devices/me/rpc/response/\$request_id

Payload:

```
{
    "method": "set_onOff_status",
    "params": {
        "type": "ble_sigmesh",
        "unicast": "0004",
        "value": 0,
        "status": "00"
    }
}
```

5. Get On/Off device or group

Example message send to Hub:

Topic: v1/devices/me/rpc/request/\$request_id
Payload:

```
{
    "method": "get_onOff",
    "params": {
        "type": "ble_sigmesh",
        "unicast": "0004"
    }
}
```

Example Hub response message:

Response received command from server

```
{
    "method": "get_onOff_status",
    "params": {
        "type": "ble_sigmesh",
        "unicast": "0004",
        "value": 0,
        "status": "00"
    }
}
```

6. Set Lightness device or group

Example message send to Hub:

Topic: v1/devices/me/rpc/request/\$request_id

Payload:

```
{
   "method": "set_lightness",
   "params": {
      "type": "ble_sigmesh",
      "unicast": "C000",
      "value": 50
   }
}
```

- + unicast: unicast address of the device or group to be controlled
- + value: lightness 0->100%

Example Hub response message:

Response received command from server

Topic: v1/devices/me/rpc/response/\$request_id

Payload:

```
{
    "method": "set_lightness_status",
    "params": {
        "type": "ble_sigmesh",
        "unicast": "0004",
        "value": 50,
        "status": "00"
    }
}
```

7. Get Lightness device or group

Example message send to Hub:

```
"method": "get_lightness",
   "params": {
     "type": "ble_sigmesh",
     "unicast": "0004"
}
```

```
Example Hub response message:
```

Response received command from server

Topic: v1/devices/me/rpc/response/\$request id

Payload:

```
{
   "method": "get_lightness_status",
   "params": {
     "type": "ble_sigmesh",
     "unicast": "0004",
     "status": "00"
   }
}
```

8. Set HSL

Example message send to Hub:

Topic: v1/devices/me/rpc/request/\$request_id
Payload:

```
{
    "method": "set_HSL",
    "params": {
        "type": "ble_sigmesh",
        "unicast": "0005",
        "Lightness": 100,
        "Hue": 360,
        "Saturation": 100
    }
}
```

- Unicast: unicast address of the device or group to be controlled
- Lightness: value 0->100
- Hue: value 0->360
- Saturation: value 0->100

Example Hub response message:

Response received command from server

```
{
    "method": "set_HSL_status",
    "params": {
```

```
"type": "ble_sigmesh",
    "unicast": "0005",
    "Lightness": 100,
    "Hue": 360,
    "Saturation": 100,
    "status": "00"
}
```

9. Call Scene

Example message send to Hub:

Response received command from server

Topic: v1/devices/me/rpc/request/\$request_id

Payload:

```
{
   "method": "scene_recall",
   "params": {
      "type": "ble_sigmesh",
      "unicast": "0005",
      "SceneNumber": 1
   }
}
```

- Unicast: unicast address of the device or group to be controlled
- SceneNumber: scene number to control

Example Hub response message:

Response received command from server

Topic: v1/devices/me/rpc/response/\$request_id

```
{
    "method": "scene_recall_status",
    "params": {
        "type": "ble_sigmesh",
        "unicast": "0005",
        "SceneNumber": 1,
        "status": "00"
    }
}
```

10. Set vendor model

Example message send to Hub:

Topic: v1/devices/me/rpc/request/\$request_id

Payload:

```
"method":"set_vendor",
    "params":{
        "type": "ble_sigmesh",
        "unicast":"unicast node",
        "opcode":"lable-opcode | opcode",
        "message":"message( int | bool | str | dict)"
    }
}
```

Hub response message:

Topic: v1/devices/me/rpc/response/\$request_id

Payload:

```
{
    "method": "vendor_status",
    "params": {
        "address": "unicast node",
        "name": "sensor name",
        "opcode": "lable-opcode",
        "message": "message( int | bool | str)"
    }
}
```

11. Get sensor

Example message send to Hub:

Topic: v1/devices/me/rpc/request/\$request_id

```
"method":"get_sensor",
   "params":{
     "type": "ble_sigmesh",
     "unicast":"unicast node",
     "properties":"properties"
}
```

```
Hub response message:
Topic: v1/devices/me/rpc/response/$request_id
Payload:
{
    "method":"sensor_status",
    "params":{
        "address":"0006",
        "<properties>": value
    }
}
```

12. Get status devices

Read about the status of all lights (onOff, Lightness, HSL)

Example message send to Hub:

Topic: v1/devices/me/rpc/request/\$request_id
Payload:

```
{
    "method": "get_status_devices",
    "params": {
        "type": "ble_sigmesh",
        "address": ["0006","0080"]
    }
}
```

- Address: list of device addresses to get state. If you want to get all devices, then "address":[]
- The above example gets the status of 2 address lights "0006" and "0080"

Example Hub response message:

```
"lightnessStatus": 80,
  "HSL_status": {
    "Lightness": 160,
    "Hue": 351,
    "Saturation": 100
  }
},
"0070": {
  "onOffStatus": 1,
  "time": 1681526561.7739537,
  "status": true,
  "lightnessStatus": 50,
  "HSL status": {
    "Lightness": 100,
    "Hue": 351,
    "Saturation": 100
```

- Time: device's last state receiving time
- Status: status lights are connected to the network. If >5 minutes without receiving a signal from the device, the status is False (the light is disconnected) otherwise it is True.
- onOffStatus: light status On/Off
- lightnessStatus: lightness
- HSL status: value HSL

13. Device status returned

To listen to the device status returned to the server, you need to subscribe to Topic: v1/devices/me/telemetry Payload:

```
<unicast>: device unicast address
<method>:
             onOffStatus:
             <param>: {
                          "address": "<unicast address>",
                          "value": <1(on) or 0(off)>
      Example On/Off status
               "method": "onOffStatus",
               "params": {
                     "address": "0004",
                     "value": 1
             lightnessStatus:
             <param>: {
                          "address": "<unicast address>",
                          "value": <int (0->100%)>
      Example Lightness status
                  "method": "lightnessStatus",
                  "params": {
                     "address": "0004",
                     "value": 100
             HSL_status:
             <param>: {
                          "address": "<unicast address>",
                          "value":
                          {
                             "Lightness": <int(0->100%)>,
       lighting smart solar home electric
```

Example HSL status

```
{
    "method": "HSL_status",
    "params": {
        "address": "0005",
        "Lightness": 100,
        "Hue": 120,
        "Saturation": 100
    }
}
```

Example Scene status

```
{
    "method": "scene_status",
    "params": {
        "currentScene": 1,
        "address": "0005"
    }
}
```

vendor_status

Example vendor status

```
{
```

```
"method":"vendor_status",
    "params":{
        "address":"0007",
        "name":"vacancy_sensor",
        "opcode":"slots_status",
        "message":true
}
```

sensor_status

Example sensor status

```
{
    "method":"sensor_status",
    "params":{
        "address":"0006",
        "voltage":220,
        "current":0.5,
        "energy":0.5
}
```

disconnectedEvent

```
<param>: {}
```

Example devices Disconnect

```
{
    "method": "disconnectedEvent",
    "params": {}
}
```

II. Zigbee

1. Set On off

Example message send to Hub:

Topic: v1/devices/me/rpc/request/\$request id

Payload:

```
{
    "method": "set_onOff",
    "params": {
        "type": "zigbee",
        "address": 12308,
        "DstEndPoint": 2,
        "SrcEndPoint": 1,
        "value": 0
    }
}
```

- Address: device address
- SrcEndPoint: endpoint hub, default = 1
- DstEndPoint: device's joystick endpoint
- Value: joystick status 1/0 (on/off)

Example Hub response message:

Topic: v1/devices/me/rpc/response/\$request_id
Payload:

```
{
  "method": "set_onOff_status",
  "params": {
    "type": "zigbee",
    "address": 12308,
    "DstEndPoint": 2,
    "SrcEndPoint": 1,
    "value": 0
  }
}
```

2. Set Lightness

Example message send to Hub:

```
{
    "method": "set_lightness",
    "params": {
        "type": "zigbee",
        "address": 12308,
```

```
"DstEndPoint": 2,
    "SrcEndPoint": 1,
    "value": 50
}
```

- Address: device address
- SrcEndPoint: endpoint hub, default = 1
- DstEndPoint: device's joystick endpoint
- Value: Lightness value 0->100%

Example Hub response message:

Topic: v1/devices/me/rpc/response/\$request_id

Payload:

```
{
   "method": "set_lightness_status",
   "params": {
      "type": "zigbee",
      "address": 12308,
      "DstEndPoint": 2,
      "SrcEndPoint": 1,
      "value": 50
   }
}
```

3. Get list devices

Example message send to Hub:

Topic: v1/devices/me/rpc/request/\$request_id
Payload:

```
{
   "method": "get_list_device",
   "params": {
      "type": "zigbee"
   }
}
```

Example Hub response message:

Topic: v1/devices/me/rpc/response/\$request id

```
"method": "list_device_status",
```

```
"params": {
    "62986": {
        "name": "CB1 LAU 4 TM",
        "addr": 62986,
        "model": "dqhome.re1"
    },
    "62989": {
        "name": "CB2 LAU 4 TM",
        "addr": 62989,
        "model": "dqhome.re1"
    }
}
```

4. Status device telemetry

Update device status automatically from hub to server

Example:

```
"val": "79", "unit": "%"
}
}]
```

- Method: device model
- Params:
 - + Addr: device address
 - + Ep: device end point
 - + States:
 - Name:
 - Relative Humidity
 - Temperature
 - Status (button)
 - lightness: 0->100%
 - Battery percent: 0->100%
 - Battery voltage
 - Val: value
 - Unit

C. SCENE AND SCHEDULE HUB

Setup shared scenarios for BLE and Zigbee or set a timer

I. Scene Hub

1. Creat scene Hub

Example message send to Hub:

- enable: true(ON) or false(OFF)
- id: id scene
- input: this is the return value of Zigbee
- output: this is the return value of BLE or Zigbee
- Comparison:
 - Less: less than (<)
 - less_equal: less than or equal (<=)
 - greater: greater than (>)
 - greater_equal: greater than or equal (>=)
 - equal (==)

Example Hub response message:

```
"method": "status",
    "params": {
        "addr": 9959,
        "state": {"name": "Status", "val": "ON"}
    },
    "output": [{
        "method": "set_onOff",
        "params": {
        "type": "ble_sigmesh",
        "unicast": "0004",
        "value": 1
    }
    }]
}
```

2. Update scene Hub

Example message send to Hub:

```
Topic: v1/devices/me/rpc/request/$request_id
```

```
"output": [{
    "method": "set_onOff",
    "params": {
        "type": "ble_sigmesh",
        "unicast": "0004",
        "value": 1
      }
    }]
}
```

Example Hub response message:

```
"method": "update scene hub status",
 "params": [
   {
     "comparison": "less"|"less_equal"|"greater"|"greater
equal"|"equal",
     "enable": true,
     "id": "",
     "input": {
       "method": "status",
       "params": {
         "addr": 9959,
         "state": {"name": "Status", "val": "ON"}
       }
     },
     "output": [{
       "method": "set onOff",
       "params": {
         "type": "ble_sigmesh",
         "unicast": "0004",
         "value": 1
```

```
}]
]
}
```

3. Get scene Hub

Example message send to Hub:

```
Topic: v1/devices/me/rpc/request/$request_id
Payload:
```

```
{
   "method": "get_scene_hub",
   "params": ""
}
```

Example Hub response message:

```
Topic: v1/devices/me/rpc/response/$request_id
Payload:
```

```
"method": "scene_hub",
 "params": [
   {
     "comparison": "less"|"less equal"|"greater"|"greater
equal"|"equal",
     "id": "1",
     "enable": true,
     "input": {
       "method": "lumi.remote.b1acn01",
       "params": {
         "addr": 24224,
         "ep": 1,
         "state": {"name": "Status", "val": 1}
       }
     },
     "output": [{
       "method": "set_onOff",
       "params": {
         "type": "ble_sigmesh",
         "unicast": "0004",
         "value": 1
```

```
}
}

}

}
```

4. Delete scene Hub

Delete 1 or more scenes

Example message send to Hub:

Topic: v1/devices/me/rpc/request/\$request_id

Payload:

```
{
   "method": "delete_scene_hub",
   "params": ["id1", "id2"]
}
```

["id1", "id2"]: "id1", "id2" are the ids of the scene to be deleted. If you want to delete all here, leave the array empty ("param":[]).

Example Hub response message:

Topic: v1/devices/me/rpc/response/\$request_id
Payload:

```
{
   "method": "delete_scene_hub_status",
   "params": ["id1", "id2"]
}
```

II. Schedule

1. Creat schedule

Example message send to Hub:

Topic: v1/devices/me/rpc/request/\$request_id

diện quang

```
},
    "output": [{
        "method": "set_onOff",
        "params": {
            "type": "ble_sigmesh",
            "unicast": "C000",
            "value": 0
        }
    }]
}
```

- enable: true(ON) or false(OFF)
- id: schedule id
- input: times
- times: time to set (in 24h format)
- weekdays: Day of the week is 0->6 Monday -> Sunday respectively
- output: joystick value if input is valid

Example Hub response message:

diện quang

```
}
}]
}
```

2. Update schedule

Example message send to Hub:

Topic: v1/devices/me/rpc/request/\$request_id

```
Payload:
  "method": "update_schedule_hub",
  "params": [
    {
      "enable":true,
      "id": "",
      "input": {
        "times": "00:00",
        "weekdays": [0, 1, 2, 3, 4, 5, 6]
      },
      "output": [{
        "method": "set_onOff",
        "params": {
          "type": "ble_sigmesh",
          "unicast": "C000",
          "value": 0
      }]
  ]
```

Example Hub response message:

```
{
    "method": "update_schedule_hub_status",
    "params": [
    {
```

```
"enable":true,
    "id": "",
    "input": {
        "times": "00:00",
        "weekdays": [0, 1, 2, 3, 4, 5, 6]
    },
    "output": [{
        "method": "set_onOff",
        "params": {
            "type": "ble_sigmesh",
            "unicast": "C000",
            "value": 0
        }
    }]
    }
}
```

3. Get schedule

Example message send to Hub:

Topic: v1/devices/me/rpc/request/\$request_id

Payload:

```
{
   "method": "get_schedule_hub",
   "params": ""
}
```

Example Hub response message:

Topic: v1/devices/me/rpc/response/\$request id

4. Delete schedule

Example message send to Hub:

Topic: v1/devices/me/rpc/request/\$request_id

Payload:

```
{
   "method": "delete_schedule_hub",
   "params": ["id1", "id2"]
}
```

["id1", "id2"]: "id1", "id2" are the ids of the scene to be deleted. If you want to delete all here, leave the array empty ("param":[]).

Example Hub response message:

Topic: v1/devices/me/rpc/response/\$request_id

```
{
   "method": "delete_schedule_hub_status",
   "params": ["id1", "id2"]
}
```