

Hoymiles MSA Micro Storage MQTT Protocol Development Guide

1. Basic Configuration information (Device Publish)

Note: The device publishes immediately after connecting, for device discovery.

topic:

homeassistant/switch/<dev_id>/config

payload:

```
{
  "state_topic": "homeassistant/sensor/<dev_id>/device/state",
  "command_topic": "homeassistant/switch/<dev_id>/set",
  "json_attributes_topic": "homeassistant/sensor/<dev_id>/attributes",
  "unique_id": "<dev_id>",
  "device": {
    "identifiers": ["<id>"],
    "name": "<dev_id>",
    "manufacturer": "Hoymiles",
    "model": "MS-A2",
    "sw_version": "1.0.0"
  }
}
```

qos:

1

retain:

true

2. Basic Attribute Information (Device Publish)

Note: Upon establishing the connection, the device immediately publishes this message to enable topic synchronization.

topic:

homeassistant/sensor/<dev_id>/attributes

payload:

```
{
  "supported_topics": {
    "quick_state": "homeassistant/sensor/<dev_id>/quick/state",
    "device_state": "homeassistant/sensor/<dev_id>/device/state",
    "system_state": "homeassistant/sensor/<dev_id>/system/state",
    "switch_ctrl": "homeassistant/switch/<dev_id>/set",
    "ems_mode": "homeassistant/select/<dev_id>/ems_mode/command",
    "power_ctrl": "homeassistant/number/<dev_id>/power_ctrl/set"
  }
}
```

qos:

1

retain:

true

note:

`supported_topics`: Indicates the topics the device supports for publishing and subscribing. `quick_state`: A topic published by the device for rapid updates of device and system status. See Chapter 10 for details. `device_state`: A topic published by the device for periodic updates of its own status. See Chapter 11 for details. `system_state`: A topic published by the device for periodic updates of system status. See Chapter 12 for details. `switch_ctrl`: A topic subscribed to by the device for power on/off control. See Chapter 7 for details. `ems_mode`: A topic subscribed to by the device for EMS mode configuration. See Chapter 8 for details. `power_ctrl`: A topic subscribed to by the device for power control commands. See Chapter 9 for details.

3. EMS Mode Configuration (Device Publish)

Note: The device publishes this message immediately after connection to notify the power control rules. This topic is only supported by the master device and standalone units.

topic:

homeassistant/select/<dev_id>/ems_mode/config

payload:

```
{
  "command_topic": "homeassistant/select/<dev_id>/ems_mode/command",
  "options": ["general", "mqtt_ctrl"],
  "unique_id": "<dev_id>",
  "device": {
    "identifiers": ["<id>"],
    "name": "<dev_id>",
    "manufacturer": "Hoymiles",
    "model": "MS-A2"
  }
}
```

qos:

1

retain:

true

note:

options: System EMS mode (general: Default mode; device manages energy using its inherent logic. mqtt_ctrl:

Enables device to control power based on MQTT commands. Energy management can be performed via the

topic homeassistant/number/<dev_id>/power_ctrl/set topic)

4. Power Control Configuration (Device Publish)

Note: The device publishes immediately after connection to notify the power control rules. This topic is only supported by the master device and standalone units.

topic:

homeassistant/number/<dev_id>/power_ctrl/config

payload:

```
{
  "name": null,
  "command_topic": "homeassistant/number/<dev_id>/power_ctrl/set",
  "device_class": "power",
  "unit_of_measurement": "w",
  "min": -1000,
  "max": 1000,
  "step": 0.1,
  "unique_id": "<dev_id>",
  "device": {
    "identifiers": ["<id>"],
    "name": "<dev_id>",
    "manufacturer": "Hoymiles",
    "model": "MS-A2"
  }
}
```

qos:

1

retain:

true

5. State of Charge Display Configuration (Device Publish)

Note: The device publishes immediately after connection to configure the display of battery state of charge information.

topic:

homeassistant/sensor/<dev_id>/soc/config

payload:

```
{
  "name": "soc",
  "state_topic": "homeassistant/sensor/<dev_id>/quick/state",
  "value_template": "{{ value_json.soc }}",
  "device_class": "battery",
  "unit_of_measurement": "%",
  "device": {
    "identifiers": [<id>],
    "name": "<dev_id>",
    "manufacturer": "Hoymiles",
    "model": "MS-A2"
  }
}
```

qos:

1

retain:

true

6. Battery Charge/Discharge Power Display Configuration (Device Publish)

Note: The device publishes immediately after connection to configure power display information.

topic:

homeassistant/sensor/<dev_id>/bat_p/config

payload:

```
{
  "name": "bat_power",
  "state_topic": "homeassistant/sensor/<dev_id>/quick/state",
  "value_template": "{{ value_json.bat_p }}",
  "device_class": "power",
  "unit_of_measurement": "W",
  "device": {
    "identifiers": [<id>],
    "name": "<dev_id>",
    "manufacturer": "Hoymiles",
    "model": "MS-A2"
  }
}
```

qos:

1

retain:

true

7. Power On/Off Control (Device Subscribe) [Reserved Feature]

Note: The device subscribes and responds, but this feature is currently not supported.

topic:

homeassistant/switch/<dev_id>/set

payload:

ON

qos:

1

retain:

false

note:

The payload can be set to types including ON and OFF.

8. EMS mode (Device Subscribe)

Note: The device subscribes and responds. This topic is only supported by the master device and standalone units.

topic:

homeassistant/select/<dev_id>/ems_mode/command

payload:

mqtt_ctrl

qos:

1

retain:

false

note:

The payload types can be set as specified in the options field under the topic

homeassistant/select/<dev_id>/ems_mode/config.

9. Power Control (Device Subscribe)

Note: The device subscribes and responds. This topic is only supported by the master device and standalone units.

topic:

homeassistant/number/<dev_id>/power_ctrl/set

payload:

80.0

qos:

1

retain:

false

note:

The payload range can be set as specified by the min and max fields under the topic

homeassistant/number/<dev_id>/power_ctrl/config.

10. Second-level Data (Device Publish)

Note: The device publishes every 1 second, including device and system data.

topic:

homeassistant/sensor/<dev_id>/quick/state

payload:

```
{
  "grid_on_p": 0.1,
  "grid_off_p": 0.1,
  "bat_sts": "standby",
  "bat_p": 0.1,
  "soc": 0.01,
  "sys_pv_p": 0.1,
  "sys_plug_p": 0.1,
  "sys_bat_p": 0.1,
  "sys_grid_p": 0.1,
  "sys_load_p": 0.1,
  "sys_sp_p": 0.1,
  "sys_soc": 0.01
}
```

qos:

0

retain:

false

note:

`grid_on_p` : Active power at the device's on-grid port (minimum unit: 0.1 W) `grid_off_p` : Active power at the device's off-grid port (minimum unit: 0.1 W) `bat_sts` : Battery status of the device (standby: standby, charge: charging, discharge: discharging, lock: locked)

`bat_p` : Battery power of the device (minimum unit: 0.1 W) `soc` : Remaining state of charge of the device (minimum unit:

0.01%) `sys_pv_p` : System photovoltaic power (minimum unit: 0.1W)

`sys_plug_p` : System socket power (minimum unit: 0.1W)

`sys_bat_p` : System battery power (minimum unit: 0.1W)

`sys_grid_p` : System grid power (minimum unit: 0.1W)

`sys_load_p` : System load power (minimum unit: 0.1W)

`sys_sp_p` : System smart socket power (minimum unit: 0.1W)

`sys_soc` : System battery state of charge (minimum unit: 0.01%)

11. Real-Time Device Data (Device Publish)

Note: The device publishes every 5 minutes.

topic:

homeassistant/sensor/<dev_id>/device/state

payload:

```
{
  "grid": [
    {
      "type": "grid_on",
      "v": 0.1,
      "i": 0.01,
      "f": 0.01,
      "p": 0.1,
      "q": 0.1,
      "ein": 1,
      "eout": 1,
      "etin": 1,
      "etout": 1
    },
    {
      "type": "grid_off",
      "v": 0.1,
      "i": 0.01,
      "f": 0.01,
      "p": 0.1,
      "q": 0.1,
      "ein": 1,
      "eout": 1,
      "etin": 1,
      "etout": 1
    },
    {
      "type": "inv",
      "v": 0.1,
      "i": 0.01,
      "p": 0.1,
      "q": 0.1,
      "ein": 1,
      "eout": 1,
      "etin": 1,
      "etout": 1
    }
  ],

  "bat_sts": "standby",
  "bat_v": 0.01,
  "bat_i": 0.01,
  "bat_p": 0.1,
  "bat_temp": 0.1,
```

```
"soc": 0.01,  
"rssi": -10  
}
```

qos:

1

retain:

false

note:

type : Device port type (grid_on: on-grid port, grid_off: off-grid port, inv: inverter port)

v : Device port voltage (minimum unit: 0.1V)

i : Device port current (minimum unit: 0.01A)

f : Device port frequency (minimum unit: 0.01Hz)

p : Device port active power (minimum unit: 0.1W)

q : Device port reactive power (minimum unit: 0.1VAR)

ein : Device port input energy of the day (minimum unit: 1Wh)

eout : Device port output energy of the day (minimum unit: 1Wh)

etin : Device port historical cumulative input energy (minimum unit: 1Wh)

etout : Device port historical cumulative output energy (minimum unit: 1Wh)

bat_sts : Device battery status (standby: standby, charge: charging, discharge: discharging, lock: locked)

bat_v : Device battery voltage (minimum unit: 0.01V)

bat_i : Device battery current (minimum unit: 0.01A)

bat_p : Device battery power (minimum unit: 0.1W)

bat_temp : Device battery temperature (minimum unit: 0.1 ° C)

soc : Device remaining state of charge (minimum unit: 0.01%) **rssi** : Device signal strength (minimum unit: 1dBm)

12. Real-Time System Data (Device Publish)

Note: The device publishes every 5 minutes. This topic is only supported by the master device and standalone units.

topic:

homeassistant/sensor/<dev_id>/system/state

payload:

```

{
  "pv_p": 0.1,
  "plug_p": 0.1,
  "bat_p": 0.1,
  "grid_p": 0.1,
  "load_p": 0.1,
  "sp_p": 0.1,
  "soc": 0.01,
  "pv_e": 1,
  "dchg_e": 1,
  "chg_e": 1,
  "plug_out_e": 1,
  "plug_in_e": 1,

  "ems_mode": "general"
}

```

qos:

1

retain:

false

note:

pv_p : System photovoltaic power (minimum unit: 0.1W)

plug_p : System socket power (minimum unit: 0.1W)

bat_p : System battery power (minimum unit: 0.1W)

grid_p : System grid power (minimum unit: 0.1W)

load_p : System load power (minimum unit: 0.1W)

sp_p : System smart socket power (minimum unit: 0.1W)

soc : System battery state of charge (minimum unit: 0.01%) **pv_e** : System daily photovoltaic energy generation
(minimum unit: 1 Wh)

dchg_e : System daily battery-side discharge energy (minimum unit: 1 Wh) **chg_e** : System daily battery-side charge
energy (minimum unit: 1 Wh)

plug_out_e : System daily grid-connected socket output energy (minimum unit: 1 Wh) **plug_in_e** : System daily grid-
connected socket input energy (minimum unit: 1 Wh) **ems_mode** : Current EMS mode of the system (general: device self-
controlled power, mqtt_ctrl: power controlled by MQTT commands)