Milesight

Building IoT Gateway

EG71

MQTT & HTTP Application Guide

Contents

Chapter 1. Introduction

EG71 supports communicating with third-party servers via HTTP(s) or MQTT(s) protocols to forward the collected data, device information and gateway information. It also supports sending downlink commands to the end devices via MQTT. This guide describes the detailed uplink and downlink formats for HTTP or MQTT communication.

Basic Steps

1. Log in to the web GUI of the gateway.
2. Add devices to the gateway or enable IO interfaces.
3. Add device objects.
4. Add an HTTP or MQTT data forwarding rule.
5. Add device objects to this data forwarding rule.

For more details, refer to the user guide.

Chapter 2. Uplink Data

When adding an MQTT topic for Uplink Data type or an HTTP URL for dataUp type, the gateway forwards the data from devices or IO interfaces. Besides, it supports adding wildcard "$gatewaySN", "$deviceName", "$devEUI", "$deveui", "objectID", "objectName" to this MQTT topic. You can replace these wildcards with actual values to filter received content when subscribing to the topic.

Note:
HTTP data forwarding only supports uplink data in the Per Object format.

Report Example for a LoRaWAN® Device without Device Model

If a LoRaWAN® Device without device model (codec) is added to a MQTT/HTTP data forwarding rule directly, the gateway will send the whole raw message.

Example for **Combined** report:

```
{
 "applicationID": 1,  //Metadata (optional)
 "applicationName": "server1",  //Metadata (optional)
 "devEUI": "24e124527f418093",  //Metadata (optional)
 "deviceID": 22,  //Metadata (optional)
 "deviceName": "WT102",  //Metadata (optional)
 "fCnt": 84,  //Metadata (optional)
 "fPort": 85,  //Metadata (optional)
 "gatewaySN": "6438F39254820003",  //Metadata (optional)
 "gatewayTime": "2026-03-23T15:45:04+08:00",  //Metadata (optional)
 "data": "DgPrCgDQBzxk", //Base64 format
 "rxInfo": [
  {
   "altitude": 0,
   "gpsEnable": false,
   "latitude": 0,
   "loRaSNR": 12.2,  //Metadata (optional)
   "longitude": 0,
   "mac": "c0ba1ffffe00733d",
   "name": "Local Gateway",
   "rssi": -57,  //Metadata (optional)
   "time": "2026-03-23T07:45:04.526398Z"
```

```
  }
 ],
 "time": "2026-03-23T07:45:04.526398Z",
 "txInfo": {
  "adr": true,
  "codeRate": "4/5",
  "dataRate": {     //Metadata (optional)
   "bandwidth": 125,
   "modulation": "LORA",
   "spreadFactor": 10
  },
  "frequency": 868100000   //Metadata (optional)
 }
}
```


Example for **Per Object** report:


```
{
 "applicationID": 1,
 "applicationName": "server1",
 "data": "DgPkCgDQBzxk",
 "devEUI": "24e124527f418093",
 "deviceID": 22,
 "deviceName": "WT102",
 "fCnt": 81,
 "fPort": 85,
 "gatewaySN": "6438F39254820003",
 "gatewayTime": "2026-03-23T15:39:04+08:00",
 "rxInfo": [
  {
   "altitude": 0,
   "gpsEnable": false,
   "latitude": 0,
   "loRaSNR": 11.5,
   "longitude": 0,
   "mac": "c0ba1ffffe00733d",
   "name": "Local Gateway",
   "rssi": -58,
```

```
    "time": "2026-03-23T07:39:03.742711Z"
   }
  ],
  "time": "2026-03-23T07:39:03.742711Z",
  "txInfo": {
   "adr": true,
   "codeRate": "4/5",
   "dataRate": {
    "bandwidth": 125,
    "modulation": "LORA",
    "spreadFactor": 10
   },
   "frequency": 868100000
  }
}
```


Report Example for Device Objects/Global Objects

If the device objects are added to a MQTT/HTTP data forwarding rule, the gateway will send the object values directly.

Note:
For AO/DO/DI interface types, the uplink data is reported only when the interface status changes.

Example for **Combined** report:


```
{
  "humidity": 50.3,
  "temperature": 27.92,
  "object": [
   {
    "objectID": 475,
    "objectName": "Humidity"  //Metadata (optional)
   },
   {
    "objectID": 559,
    "objectName": "Temperature"  //Metadata (optional)
   }
```

```
 ],
 "SNR": 13,  //Metadata (LoRaWAN optional)
 "applicationID": 1,  //Metadata (optional)
 "applicationName": "server1",  //Metadata (optional)
 "dataRate": "SF10BW125",  //Metadata (LoRaWAN optional)
 "devEUI": "24e124409f232585",  //Metadata (LoRaWAN optional)
 "deviceID": 29,  //Metadata (optional)
 "deviceName": "WT401",  //Metadata (optional)
 "fCnt": 3,  //Metadata (LoRaWAN optional)
 "fPort": 85,  //Metadata (LoRaWAN optional)
 "frequency": 868300000,  //Metadata (LoRaWAN optional)
 "gatewaySN": "6438F39254820003",  //Metadata (optional)
 "gatewayTime": "2026-03-23T15:57:47+08:00",  //Metadata (optional)
 "rssi": -48  //Metadata (LoRaWAN optional)
}
```

Example for **Per Object** report:

```
{
 "gatewaySN": "6438F39254820003",
 "info": {
  "objectID": 475,
  "objectValue": 50
 },
 "metadata": {  //optional
  "deviceID": 29,
  "deviceName": "WT401",
  "objectName": "Humidity"
 }
}
```

```
{
 "gatewaySN": "6438F39254820003",
 "info": {
  "objectID": 559,
  "objectValue": 27.72
 },
 "metadata": {  //optional
  "deviceID": 29,
```

```
    "deviceName": "WT401",
    "objectName": "Temperature"
  }
}
```

```
//Metadata (optional)
{
  "gatewaySN": "6438F39254820003",
  "info": {
    "objectID": 409,
    "objectValue": 13.8
  },
  "metadata": {   //optional
    "deviceID": 29,
    "deviceName": "WT401",
    "objectName": "SNR"
  }
}
```

.....

Chapter 3. Downlink Data

When adding an MQTT topic for Downlink Data type, the gateway forwards the downlink commands from the MQTT broker to devices or IO interfaces. The downlink format must be JSON and varies based on the wildcard type in the downlink topic.

Downlink Example for the Topic without Wildcard

Example for sending a downlink message to a LoRaWAN® device:

```
{
 "devEUI": "24E124406F079198",  //Target device EUI
 "fPort": 85,    //Device application port
 "data": "/xD/",  //Base64 format
 "confirmed": false  //Whether to ask device to send downlink confirmed packet
}
```

Example for sending a downlink message to a LoRaWAN® device object:

```
{
 "devEUI": "24E124406F079198",  //Target device EUI
 "fPort": 85,    //Device application port
 "object":{"history_enable":1},  //JSON format
 "confirmed": false  //Whether to ask device to send downlink confirmed packet
}
```

Example for sending a downlink message to any device object:

```
{
 "gatewaySN": "6438F39254820003", //Optional
 "objectInfo": [
  {
   "objectID": 5,   //The ID from Data Forwarding page
   "objectValue": "1123"
  }
 ]
}
```

Downlink Format for the Topic with Wildcard

If the MQTT topic contains wildcards, replace these wildcards with actual values when subscribing to this topic.

Example 1: The topic has wildcard *$objectID*

Topic example: `/eg/downlink/$objectID/`

If the object ID is 5, send downlink command to topic `/eg/downlink/5/`:

```
{
 "objectValue": "1123"
}
```

Example 2: The topic has wildcard *$gatewaySN*, *$devEUI*, *$deveui*, or *$deviceID*

Topic example: `/eg/downlink/$deviceID/`

If the device ID is 5, send downlink command to topic `/eg/downlink/5/`:

```
{
 "objectInfo": [
  {
   "objectID": 5,   //The ID from Data Forwarding page
   "objectValue": "1123"
  }
 ]
}
```

Example 3: The topic has wildcard *$devEUI* or *$deveui*

Topic example: `/eg/downlink/$deveui/`

If the device EUI is 24E124527F418093, send downlink command to topic `/eg/downlink/24E124527F418093/`:

```
{
 "fPort": 85,    //Device application port
 "object":{"history_enable":1},   //JSON format
 "confirmed": false  //Whether to ask device to send downlink confirmed packet
}
```

Chapter 4. Multicast Downlink Data

When adding an MQTT topic for Multicast Downlink Data type, the gateway forwards downlink commands from the MQTT broker to a LoRaWAN® multicast group. This requires that Multicast Groups have been added.

Downlink Example:

```
{
 "multicastName": "Group1",
 "fPort": 85,
 "data": "/xD/"  //base64 format
}
```

Chapter 5. Notification

The gateway supports the following types of notification messages to forward by adding the corresponding MQTT topic or HTTP URL.

Online Notification

Report when a device status changes to online.

Report Example:

```
{
 "applicationID": 1,
 "applicationName": "server1",
 "devAddr": "0642fa41",   //LoRaWAN® device only
 "devEUI": "24e124527f418093",   //LoRaWAN® device only
 "deviceID": 22,
 "deviceName": "WT102",
 "gatewaySN": "6438F39254820003",
 "status": "online",
 "time": "2026-03-12T06:40:13Z"
}
```

Offline Notification

Report when a device status changes to offline.

Report Example:

```
{
 "applicationID": 1,
 "applicationName": "server1",
 "devAddr": "07812782",    //LoRaWAN® device only
 "devEUI": "24e124527f418093",    //LoRaWAN® device only
 "deviceID": 22,
 "deviceName": "WT102",
 "gatewaySN": "6438F39254820003",
 "status": "offline",
 "time": "2026-03-23T10:48:19+08:00"
}
```

ACK Notification

Report the ACK message after a device receives the downlink command. This only applies to LoRaWAN® devices.

Report Example:


```
{
 "acknowledged": true,
 "applicationID": 1,
 "applicationName": "server1",
 "devEUI": "24e124527f418093",
 "deviceID": 22,
 "deviceName": "WT102",
 "fcnt": 4996,
 "gatewaySN": "6438F39254820003",
 "time": "2026-03-12T06:10:30Z"
}
```


Error Notification

Report if any device error occurs.

Report Example:


```
{
 "applicationID": 1,
 "applicationName": "server1",
 "devEUI": "24e124527f418093",
 "deviceID": 22,
 "deviceName": "WT102",
 "error": "downlink error,device offline",
 "gatewaySN": "6438F39254820003",
 "time": "2026-03-12T06:10:30Z"
}
```

Chapter 6. Management Request and Response

The gateway provides an interface for querying the device and object info using Management topics. Users can send a blank packet or any content to Management Request topic and receive query results from Management Response topic.

Note:
The Management Request and Management Response topics must be different.

Response Example:


```
{
 "deviceCount": 2,
 "gatewaySN": "6438F39254820003",
 "info": [
  {
   "deviceID": 1,
   "deviceName": "AO-1",
   "objectCount": 1,
   "objectInfo": [
    {
     "objectID": 1,
     "objectName": "Present Value"
    }
   ]
  },
  {
   "deviceID": 5,
   "deviceName": "DO-1",
   "objectCount": 1,
   "objectInfo": [
    {
     "objectID": 5,
     "objectName": "Present Value"
    }
   ]
  }
```

```
 ]
}
```