



Milesight Gateway

MQTT API Specification

Date	Applicable Firmware Version	Description
Apr. 28, 2023	60.0.0.42/56.0.0.3	Initial version
Apr. 15, 2024	60.0.0.42-r5/56.0.0.4	Add payload codec enquiry

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1. Introduction

Milesight gateways provides MQTT API to invoke them to configure the gateway embedded network server settings. It is necessary to add a MQTT integration to an application and subscribe below topics to send requests and get responses.

Data Type	topic	QoS
Uplink data	<input type="text"/>	QoS 0
Downlink data	<input type="text"/>	QoS 0
Multicast downlink data	<input type="text"/>	QoS 0
Join notification	<input type="text"/>	QoS 0
ACK notification	<input type="text"/>	QoS 0
Error notification	<input type="text"/>	QoS 0
Request data	<input type="text"/>	QoS 0
Response data	<input type="text"/>	QoS 0

The request message should be sent via JSON format and the response format is also the JSON format.

Request Format

```
{
  "type": "ns-api",           //The type is fixed as ns-api
  "id": "123",               //Random value
  "method": "GET",          //method
  "url": "/api/urdevices",  //url
  "gatewayEUI": "",         //Type optional
  "body": {
    //Add contents when method is POST or PUT
  }
}
```

Response Format

```
{
  "id": "123",               //The same as request
  "gatewayEUI": "24E124FFFEF5A6A8", //Point the response source of gateway
  "method": "GET",          //The same as request
  "gatewayEUI": "",
  "url": "/api/urdevices",  //The same as request
  "body": {
    //Different contents depending on features
  }
}
```

2. Profile

2.1 Add Profile

Method: POST

URL: /api/urprofiles

Request Example

```
{
  "type":"ns-api",
  "id":"1",
  "method":"POST",
  "url":"/api/urprofiles",
  "body":{
    "name":"test",
    "profile":{
      "factoryPresetFreqs":[
      ],
      "macVersion":"1.0.2",
      "maxEIRP":0,
      "regParamsRevision":"B",
      "rxDROffset1":0,
      "rxDataRate2":0,
      "rxFreq2":505300000,
      "supports32bitFCnt":true,
      "supportsClassB":true,
      "supportsClassC":true,
      "supportsJoin":true,
      "pingSlotPeriod":128,
      "pingSlotDR":2,
      "pingSlotFreq":508300000,
      "classBTimeout":10,
      "classCTimeout":10,
      "enableUplinkChannels":[
      ]
    }
  }
}
```

Response Example

```
{
  "id":"1",
  "method":"POST",
  "url":"/api/urprofiles",
  "body":{
    "profileID":"c6686391-55a3-40fe-a347-acd431211c58"
    //Return profile ID if success, failure return code see Appendix
  }
}
```

Request Parameters

Name	Type & Range	Default	Required	Description
name	string 64	-	Yes	Only allow letters, digits, "-" or "_", the first character must be letter
maxEIRP	int	0	No	0 means max EIRP
supportsJoin	bool	false	No	True: OTAA False: ABP
supportsClassB	bool	false	No	True: support Class B
supportsClassC	bool	false	No	True: support Class C
macVersion	1.0.0/1.0.1/1.0.2/1.1.0	1.0.2	No	
regParamsRevision	A / B	B	No	It's B for Milesight devices
rxDROffset1	0/1/2/3/4/5	0	No	
rxDataRate2	int	Depend on channel plan	No	See details on Appendix
rxFreq2	int	Depend on channel plan	No	See details on Appendix
factoryPresetFreqs	array[int]		No	
enableUplinkChannels	array[int]		No	Blank means all channels are enabled
pingSlotPeriod	32/64/128/256/512/1024/2048/4096	128 (every 4 second)	No	Class B device only, every option matches 1/2/4/8/16/32/64/128 seconds
pingSlotDR	int	Depend on channel plan	No	Class B device only, see details on Appendix
pingSlotFreq	int	Depend on channel plan	No	Class B device only, see details on Appendix
classBTimeout	0-10 (second)	10	No	Class B device ACK timeout
classCTimeout	0-10 (second)	10	No	Class C device ACK timeout

2.2 Delete Profile

Method: DELETE

URL: /api/urprofiles/{profileID}

Request Example

```
{
  "type": "ns-api",
  "id": "1",
  "method": "DELETE",
  "url": "/api/urprofiles/09c9326b-0fc6-42ce-ae32-808d58306a50"
}
```

Response Example

```
{
  "id": "1",
  "method": "DELETE",
  "url": "/api/urprofiles/09c9326b-0fc6-42ce-ae32-808d58306a50",
  "body": {
    "code": ,
    "error": ""
    //Body is blank if success, failure return code see Appendix
  }
}
```

2.3 Enquire Profile

Method: GET

URL: /api/urprofiles?limit=9999&offset=0

Request Example: enquire all profiles

```
{
  "type": "ns-api",
  "id": "1",
  "method": "GET",
  "url": "/api/urprofiles?limit=9999&offset=0"
}
```

Response Example

```
{
  "id": "1",
  "method": "GET",
  "url": "/api/urprofiles?limit=9999&offset=0",
  "body": {
    "totalCount": "1",
    "disable": false,
    "result": [
      {
        "profile": {
          "profileID": "940dcdb-8d5b-4a1e-b7c6-4e5437162015",
          "supportsClassB": false,

```

```

        "classBTimeout":10,
        "pingSlotPeriod":128,
        "pingSlotDR":2,
        "pingSlotFreq":508300000,
        "supportsClassC":false,
        "classCTimeout":10,
        "macVersion":"1.0.2",
        "regParamsRevision":"B",
        "rxDROffset1":0,
        "rxDataRate2":0,
        "rxFreq2":505300000,
        "factoryPresetFreqs":[
        ],
        "maxEIRP":0,
        "maxDutyCycle":0,
        "supportsJoin":true,
        "rfRegion":"China470",
        "supports32bitFCnt":true,
        "enableUplinkChannels":[
        ]
    },
    "name":"ClassA-OTAA",
    "organizationID":"1",
    "networkServerID":"1",
    "using":true
}
],
"channelPlan":"CN470"
}
}

```

Request Parameters

Name	Type & Range	Default	Required	Description
limit	int	9999	No	Max amount of enquiring profiles
offset	int	0	No	Enquire from which profile

Response Parameters

Name	Type	Description
totalCount	string	The profile amount of enquiry
disable	bool	Whether Milesight IoT Cloud is enabled
result	array	Profile contents
profileID	string	
supportsClassB	bool	True: support Class B
classBTimeout	int	Class B device ACK timeout

pingSlotPeriod	int	Class B device ping slot period
pingSlotDR	int	Class B device ping slot datarate
pingSlotFreq	int	Class B device ping slot frequency
supportsClassC	bool	True: support Class C
classCTimeout	int	Class C device ACK timeout
macVersion	string	
regParamsRevision	string	It's B for Milesight devices
rxDROffset1	int	
rxDataRate2	int	See details on Appendix
rxFreq2	int	See details on Appendix
factoryPresetFreqs	array[int]	
maxEIRP	int	0 means max EIRP
maxDutyCycle	int	
supportsJoin	bool	True: OTAA False: ABP
rfRegion	string	
enableUplinkChannels	array[int]	Blank means all channels are enabled
name	string	Profile name
organizationID	string	
networkServerID	string	
using	bool	Whether this profile is used
isDefault	bool	Whether this is default profile
channelPlan	string	Frequency channel plan

2.4 Modify Profile

Before modifying a profile, it is suggested to enquire this profile first.

Method: PUT

URL: /api/urprofiles/{profileID}

Request Example

```
{
  "type": "ns-api",
  "id": "1",
  "method": "PUT",
  "url": "/api/urprofiles/d11c2c2f-543e-4b6f-b393-3e8e6b0e76e4",
  "body": {
    "name": "test",
```



```

"profile":{
  "supportsClassB":true,
  "classBTimeout":10,
  "pingSlotPeriod":128,
  "pingSlotDR":2,
  "pingSlotFreq":508300000,
  "supportsClassC":true,
  "classCTimeout":10,
  "macVersion":"1.0.2",
  "regParamsRevision":"B",
  "rxDROffset1":0,
  "rxDataRate2":0,
  "rxFreq2":505300000,
  "factoryPresetFreqs":[
  ],
  "maxEIRP":0,
  "supportsJoin":true,
  "supports32bitFCnt":true,
  "enableUplinkChannels":[
  ]
}
}
}
}

```

Response Example

```

{
  "id":"1",
  "method":"PUT",
  "url":"/api/urprofiles/d11c2c2f-543e-4b6f-b393-3e8e6b0e76e4",
  "body": {
    "code": ,
    "error":""
  }
}

```

//Body is blank if success, failure return code see Appendix

Request Parameters

Name	Type & Range	Required	Description
name	string 64	Yes	Only allow letters, digits, "-" or "_", the first character must be letter
maxEIRP	int	Yes	0 means max EIRP
supportsJoin	bool	Yes	True: OTAA False: ABP
supportsClassB	bool	Yes	True: support Class B
supportsClassC	bool	Yes	True: support Class C

sC			
macVersion	1.0.0/1.0.1/1.0.2/1.1.0	Yes	
regParamsRevision	A / B	Yes	It's B for Milesight devices
rxDROffset1	0/1/2/3/4/5	Yes	
rxDataRate2	int	Yes	See details on Appendix
rxFreq2	int	Yes	See details on Appendix
factoryPresetFreqs	array[int]	Yes	
enableUplinkChannels	array[int]	Yes	Blank means all channels are enabled
supports32bitFCnt	bool	Yes	
pingSlotPeriod	32/64/128/256/512/1024/2048/4096	Yes	Class B device only, every option matches 1/2/4/8/16/32/64/128 seconds
pingSlotDR	int	Yes	Class B device only, see details on Appendix
pingSlotFreq	int	Yes	Class B device only, see details on Appendix
classBTimeout	0-10 (second)	Yes	Class B device ACK timeout
classCTimeout	0-10 (second)	Yes	Class C device ACK timeout

3. Device

3.1 Add Device

Method: POST

URL: /api/urdevices

Request Example

```
{
  "type": "ns-api",
  "id": "1",
  "method": "POST",
  "url": "/api/urdevices",
  "body": {
    "name": "EM300",
    "description": "em300",
    "devEUI": "24E124136A456465",
    "profileID": "940dcdb8-8d5b-4a1e-b7c6-4e5437162015",
    "fPort": 1,
  }
}
```

```

    "skipFCntCheck":false,
    "appKey":"5572404c696e6b4c6f52613230313823",
    "applicationID":"1",
    "payloadCodeCID":"9"
  }
}

```

Response Example

```

{
  "id": "1",
  "method": "POST",
  "url": "/api/urdevices",
  "body": {
    "code": 200,
    "error":""
  }
}

```

//Return 200 if success, failure return code see Appendix

Request Parameters

Name	Type & Range	Default	Required	Description
devEUI	string 16(HEX)	-	Yes	Device EUI is unique
applicationID	int	-	Yes	Exist application ID
payloadCodeCID	int	-	No	Get this ID from Enquire Payload Codec API
name	string 64	DevEUI	No	Unique value on device list
description	string 1024	DevEUI	No	Device description
profileID	string	ClassA-OTAA profile ID	No	Enquire profile ID first
fPort	1-223	1	No	Device application port
skipFCntCheck	bool	false	No	Frame counter validation
appKey	string 32(HEX)	5572404c696e6b4c6f52613230313823	No	Necessary to add when join type is OTAA
devAddr	string 8(HEX)	-	Yes	Necessary to add when join type is ABP
nwkSKey	string 32(HEX)	5572404c696e6b4c6f52613230313823	No	Necessary to add when join type is ABP
appSKey	string 32(HEX)	5572404c696e6b4c6f52613230313823	No	Necessary to add when join type is ABP
fCntUp	0~4294967295	0	No	Add when join type is ABP

fCntDown	0~4294967295	0	No	Add when join type is ABP
mbMode	string "tcp"/"rtu"	-	No	tcp: Modbus RTU to TCP rtu: Modbus RTU over TCP
mbFramePort	2-84, 86-223	-	No	Modbus RTU Fport
mbTcpPort	1-65535	-	No	Modbus TCP port

3.2 Delete Device

Method: DELETE

URL: /api/urdevices/{devEUI}

Request Example

```
{
  "type": "ns-api",
  "id": "1",
  "method": "DELETE",
  "url": "/api/urdevices/24E124136A456465",
}
```

Response Example

```
{
  "id": "1",
  "method": "DELETE",
  "url": "/api/urdevices/24E124136A456465",
  "body": {
    "code": 200,
    "error": ""
  }
}
//Body is blank if success, failure return code see Appendix
```

3.3 Enquire Device

Method: GET

URL: /api/urdevices?search=&limit=&offset=&applicationID=

Request Example:

1. enquire all devices

```
{
  "type": "ns-api",
  "id": "1",
  "method": "GET",
  "url": "/api/urdevices?&offset=0&limit=9999"
```

```
}
```

2. enquire all devices under one application

```
{  
  "type": "ns-api",  
  "id": "2",  
  "method": "GET",  
  "url": "/api/urdevices?applicationID=1&offset=0&limit=9999"  
}
```

3. enquire one device

```
{  
  "type": "ns-api",  
  "id": "2",  
  "method": "GET",  
  "url": "/api/urdevices?applicationID=1&offset=0&limit=9999"  
}
```

Response Example

```
{  
  "id": "1",  
  "method": "GET",  
  "url": "/api/urdevices?&offset=0&limit=9999",  
  "body": {  
    "devTotalCount": "1",  
    "deviceResult": [  
      {  
        "devEUI": "24E124136A456465",  
        "name": "em300-470",  
        "applicationID": "1",  
        "appName": "cloud",  
        "description": "em300",  
        "profileID": "940dcdbbe-8d5b-4a1e-b7c6-4e5437162015",  
        "profileName": "ClassA-OTAA",  
        "fCntUp": 0,  
        "fCntDown": 0,  
        "skipFCntCheck": false,  
        "appKey": "5572404c696e6b4c6f52613230313823",  
        "devAddr": "",  
        "appSKey": "",  
        "nwksKey": "",  
        "supportsJoin": true,  
        "active": false,  

```

```

        "lastSeenAt":"-",
        "mbMode": "",
        "mbFramePort": "0",
        "mbTcpPort": "0",
        "lastSeenAtTime":"-",
        "fPort": 2,
        "payloadCodecID": "0",
        "payloadName": ""
    }
],
"appTotalCount": "1",
"appResult": [
    {
        "appName": "cloud",
        "applicationID": "1"
    }
],
"pfTotalCount": "3",
"profileResult": [
    {
        "profileID": "940dcdb8-8d5b-4a1e-b7c6-4e5437162015",
        "profileName": "ClassA-OTAA",
        "supportsJoin": true
    },
    {
        "profileID": "321d917c-297a-4d1b-baa1-6329e694a94e",
        "profileName": "ClassB-OTAA",
        "supportsJoin": true
    },
    {
        "profileID": "176d917c-297a-4d0b-baa1-6189e694a94e",
        "profileName": "ClassC-OTAA",
        "supportsJoin": true
    }
],
"channelPlan": "CN470",
"disable": false
}
}

```

Request Parameters

Name	Type & Range	Default	Required	Description
search	string	-	No	Blank means searching for all devices
limit	int	9999	No	Max amount of enquiring devices

offset	int	0	No	Enquire from which device
applicationID	int	0	No	Enquire devices under this application, 0 means enquiring all devices

Response Parameters

Name	Type	Description
devTotalCount	string	The device amount of enquiry
devEUI	string	Device EUI
name	string	Device name
applicationID	string	Application ID
appName	string	Application name
description	string	Device description
profileID	string	Profile ID
profileName	string	Profile name
fCntUp	int	
fCntDown	int	
skipFCntCheck	bool	Frame count validation
appKey	string	
devAddr	string	
nwkSKey	string	
appSKey	string	See details on Appendix
supportsJoin	bool	True: OTAA, False: ABP
active	bool	True: activate, False: De-activate
lastSeenAt	string	
mbMode	string	tcp: Modbus RTU to TCP rtu: Modbus RTU over TCP
mbFramePort	int	Modbus RTU Fport
mbTcpPort	int	Modbus TCP port
lastSeenAtTime	string	
fPort	int	Device application port
payloadCodecID	string	Payload Codec ID
payloadName	string	Payload Codec name
appTotalCount	string	Application total count
pfTotalCount	string	Profile total count
channelPlan	string	Frequency channel plan
disable	bool	Whether Milesight IoT Cloud is enabled

3.4 Modify Device

Before modifying a device, it is suggested to enquire this device first.

Method: PUT

URL: /api/urdevices/{devEUI}

Request Example

```
{
  "type": "ns-api",
  "id": "1",
  "method": "PUT",
  "url": "/api/urdevices/24E124136A456465",
  "body": {
    "name": "EM300",
    "applicationID": "1",
    "description": "em300",
    "profileID": "fa8215d4-4b5a-4054-b6ba-5658609861d1",
    "fCntUp": 0,
    "fCntDown": 0,
    "skipFCntCheck": false,
    "appKey": "5572404c696e6b4c6f52613230313823",
    "devAddr": "",
    "appSKey": "",
    "nwkSKey": "",
    "mbMode": "",
    "mbFramePort": 0,
    "mbTcpPort": 0,
    "fPort": 1,
    "payloadCodeCID": "9"
  }
}
```

Response Example

```
{
  "id": "1",
  "method": "PUT",
  "url": "/api/urdevices/24E124136A456467",
  "body": {
    //Return 200 if success, failure return code see Appendix
    "code": 200,
    "error": ""
  }
}
```

Request Parameters

Name	Type & Range	Required	Description
------	--------------	----------	-------------

name	string 64	No	Unique value on device list
description	string 1024	No	
profileID	string	No	Enquire profile ID first
applicationID	int	Yes	Exist application ID
payloadCode cID	int	No	Get this ID from Enquire Payload Codec API
fPort	1-223	No	Device application port
skipFCntChec k	bool	No	Frame counter validation
appKey	string 32(HEX)	No	Support to modify when join type is OTAA
devAddr	string 8(HEX)	Yes	Support to modify when join type is ABP
nwkSKey	string 32(HEX)	No	Support to modify when join type is ABP
appSKey	string 32(HEX)	No	Support to modify when join type is ABP
fCntUp	0~4294967295	No	Support to modify when join type is ABP
fCntDown	0~4294967295	No	Support to modify when join type is ABP
mbMode	string "tcp"/"rtu"	No	tcp: Modbus RTU to TCP rtu: Modbus RTU over TCP
mbFramePor t	2-84, 86-223	No	Modbus RTU Fport
mbTcpPort	1-65535	No	Modbus TCP port

4. Multicast

4.1 Add Multicast Group

Method: POST

URL: /api/multicast-groups

Request Example

```
{
  "type":"ns-api",
  "id":"1",
  "method":"POST",
  "url":"/api/multicast-groups",
  "body":{
    "multicastGroup":{
      "mcAddr":"11111111",
      "name":"group1",
      "mcNwkSKey":"5572404c696e6b4c6f52613230313823",
      "mcAppSKey":"5572404c696e6b4c6f52613230313823",
      "groupType":"CLASS_C",
      "fCnt":0,

```

```

        "dr":0,
        "pingSlotPeriod":128,
        "frequency":505300000
    }
}

```

Response Example

```

{
  "id":"1",
  "method":"POST",
  "url":"/api/multicast-groups",
  "body":{
    "id":"03881b5e-9af0-4a38-860c-bdc25347f739"
  }
}

```

//Return multicast ID if success, failure return code see Appendix

Request Parameters

Name	Type & Range	Default	Required	Description
name	string 128	-	Yes	Name is unique
mcAddr	string 8(HEX)	11111111	No	Multicast address
mcNwkSKey	string 32(HEX)	5572404c696 e6b4c6f5261 3230313823	No	Multicast NetworkSKey
mcAppSKey	string 32(HEX)	5572404c696 e6b4c6f5261 3230313823	No	Multicast ApplicationSKey
fCnt	0-4294967295	0	No	Frame-counter validation
groupType	string "CLASS_B"/"CLASS_C"	CLASS_C	No	The device type should be class B or class C
dr	int	Depend on channel plan	No	See details on Appendix
frequency	int	Depend on channel plan	No	See details on Appendix
pingSlotPeriod	32/64/128/256/512/1024/2048/4096	128	No	Class B device only, every option matches 1/2/4/8/16/32/64/128 seconds

4.2 Add Device to Multicast Group

Method: POST

URL: /api/multicast-groups/{multicastGroupID}/devices

Request Example

```
{
  "type": "ns-api",
  "id": "1",
  "method": "POST",
  "url": "/api/multicast-groups/03881b5e-9af0-4a38-860c-bdc25347f739/devices",
  "body": {
    "devEUIs": [
      "24E124136A456467",
      "24E124136A456465"
    ]
  }
}
```

Response Example

```
{
  "id": "1",
  "method": "POST",
  "url": "/api/multicast-groups/03881b5e-9af0-4a38-860c-bdc25347f739/devices",
  "body": {
    //body is blank if success
  }
}
```

Request Parameters

Name	Type & Range	Default	Required	Description
devEUIs	Array [string 16](HEX)	-	No	The devices should be added to device list

4.3 Delete Multicast Group

Method: DELETE

URL: /api/multicast-groups/{multicastGroupID}

Request Example

```
{
  "type": "ns-api",
  "id": "1",
  "method": "DELETE",
  "url": "/api/multicast-groups/8cc84500-9587-4256-bd7e-4f265c56f8ee"
}
```

Response Example

```
{
  "id": "1",
  "method": "DELETE",
  "url": "/api/multicast-groups/8cc84500-9587-4256-bd7e-4f265c56f8ee",
}
```

```

"body":{
  "code": , //Body is blank if success, failure return code see Appendix
  "error":""
}
}

```

Request Parameters

Name	Type	Default	Required	Description
multicastGroupID	string	-	Yes	The multicast group ID can be searched by API

4.4 Delete Device from Multicast Group

Method: POST

URL: /api/multicast-groups/{multicastGroupID}/deletedevices

Request Example

```

{
  "type": "ns-api",
  "id": "1",
  "method": "POST",
  "url": "/api/multicast-groups/0663aff7-3223-4874-ad6a-b306c63a38e7/deletedevices",
  "body":{
    "devEUIs":[
      "24E124136A456467"
    ]
  }
}

```

Response Example

```

{
  "id":"1",
  "method":"POST",
  "url":"/api/multicast-groups/0663aff7-3223-4874-ad6a-b306c63a38e7/deletedevices",
  "body":{
    //Body is blank if success, failure return code see Appendix
    "code": ,
    "error":""
  }
}

```

Request Parameters

Name	Type	Default	Required	Description
multicastGroupID	string	-	Yes	The multicast group ID can be searched by API
devEUIs	Array [string 16](HEX)	-	No	The devices should be existed to device list

4.5 Enquire Multicast Group

Method: GET

URL: /api/multicast-groups?search=&limit=&offset=

Request Example:

1. enquire all groups

```
{
  "type": "ns-api",
  "id": "1",
  "method": "GET",
  "url": "/api/multicast-groups?search=&order=asc&offset=0&limit=9999"
}
```

2. enquire one group

```
{
  "type": "ns-api",
  "id": "2",
  "method": "GET",
  "url": "/api/multicast-groups?search=group1&offset=0&limit=9999"
}
```

Response Example

```
{
  "id": "1",
  "method": "GET",
  "url": "/api/multicast-groups?search=&order=asc&offset=0&limit=9999",
  "body": {
    "totalCount": "1",
    "result": [
      {
        "id": "0663aff7-3223-4874-ad6a-b306c63a38e7",
        "name": "group1",
        "mcAddr": "11111111",
        "mcNwkSKey": "5572404c696e6b4c6f52613230313823",
        "mcAppSKey": "5572404c696e6b4c6f52613230313823",
        "fCnt": 0,
        "groupType": "CLASS_C",
        "dr": 0,
        "frequency": 505300000,
        "pingSlotPeriod": 128,
        "createdAt": "2023-02-02 01:18:10",
        "updatedAt": "2023-02-02 01:27:10",
      }
    ]
  }
}
```

```

"devices":[
  {
    "devEUI":"24E124136A456467",
    "name":"em300-470",
    "applicationID":"1",
    "description":"em300",
    "deviceProfileID":"940dcdbbe-8d5b-4a1e-b7c6-4e5437162015",
    "deviceProfileName":"ClassA-OTAA",
    "deviceStatusBattery":0,
    "deviceStatusMargin":0,
    "lastSeenAt":""
  }
]
}
]
}
}
}

```

Request Parameters

Name	Type	Default	Required	Description
search	string	-	No	Blank means searching for all groups
limit	int	9999	No	Max amount of enquiring groups
offset	int	0	No	Enquire from which group

Return Parameters

Name	Type	Description
id	string	Multicast ID
name	string	Name is unique
mcAddr	string	Multicast address
mcNwkSKey	string	Multicast NetworkSKey
mcAppSKey	string	Multicast ApplicationSKey
fCnt	int	Frame-counter validation
groupType	string	Class B or class C
dr	int	See details on Appendix
frequency	int	See details on Appendix
pingSlotPeriod	int	Class B device only, every option matches 1/2/4/8/16/32/64/128 seconds
createdAt	string	Create time
updatedAt	string	Configuration update time
devEUI	string	Device EUI of devices on this group
name	string	Device name

applicationID	string	applicationID
description	string	Device description
deviceProfileID	string	Device Profile ID
deviceProfileName	string	Device Profile name
deviceStatusBattery	int	Battery level
deviceStatusMargin	int	
lastSeenAt	string	

4.6 Modify Group

Before modifying a group, it is suggested to enquire this group first.

Method: PUT

URL: /api/multicast-groups/{multicastGroupID}

Request Example

```
{
  "type":"ns-api",
  "id":"1",
  "method":"PUT",
  "url":"/api/multicast-groups/0663aff7-3223-4874-ad6a-b306c63a38e7",
  "body":{
    "multicastGroup":{
      "name":"group2",
      "mcAddr":"11111111",
      "mcNwkSKey":"5572404c696e6b4c6f52613230313823",
      "mcAppSKey":"5572404c696e6b4c6f52613230313823",
      "fCnt":0,
      "groupType":"CLASS_C",
      "dr":0,
      "frequency":505300000,
      "pingSlotPeriod":128
    }
  }
}
```

Response Example

```
{
  "id":"1",
  "method":"PUT",
  "url":"/api/multicast-groups/0663aff7-3223-4874-ad6a-b306c63a38e7",
  "body":{ //Body is blank if success, failure return code see Appendix
  }
}
```

Request Parameters

Name	Type & Range	Required	Description
------	--------------	----------	-------------

name	string 128	Yes	Name is unique
mcAddr	string 8(HEX)	Yes	Multicast address
mcNwkSKey	string 32(HEX)	Yes	Multicast NetworkSKey
mcAppSKey	string 32(HEX)	Yes	Multicast ApplicationSKey
fCnt	Int 0-4294967295	Yes	Frame-counter validation
groupType	string "CLASS_B"/"CLASS_C"	Yes	The device type should be class B or class C
dr	int	Yes	See details on Appendix
frequency	int	Yes	See details on Appendix
pingSlotPeriod	32/64/128/256/512/1024/2048/4096	Yes	Class B device only, every option matches 1/2/4/8/16/32/64/128 seconds

5. Payload Codec

5.1 Enquire Payload Codec

Method: GET

URL: /api/payloadcodecs/?type=&search=&limit=&offset=

Request Example:

```
{
  "type": "ns-api",
  "id": "1",
  "method": "GET",
  "url": "/api/payloadcodecs?limit=10&offset=0&type=custom"
}
```

Response Example

```
{
  "id": "1",
  "gatewayEUI": "0242ACFFFE160007",
  "method": "GET",
  "url": "/api/payloadcodecs?limit=10/offset=0/type=custom",
  "body": {
    "totalCount": "1",
    "result": [
      {
```



```

        "id": "285",
        "name": "test",
        "description": "",
        "templateID": "0",
        "devEUIPrefix": "",
        "encoderScript": "test",
        "decoderScript": "test",
        "testEnabled": false,
        "fPort": 1
    }
}
}
}
}

```

Request Parameters

Name	Type & Range	Default	Required	Description
type	default, custom	default	Yes	Default: inbuilt payload codec library Custom: custom payload codec
search	string	-	Yes	Blank means searching for all payload codec
limit	int	9999	Yes	Max amount of queries
offset	int	0	Yes	Enquire from which payload codec

Response Parameters

Name	Type	Description
totalCount	int	The amount of enquiry
result	array	Payload codec content
name	string	Payload codec name
description	string	
templateID	int	The template ID used in this custom payload codec
devEUIPrefix	string	
encoderScript	string	Encoder content
decoderScript	int	Decoder content
testEnabled	bool	
fPort	int	fPort in test

Appendix

Return Code List

Code	Description
200	Success
2	Unknown error
3	Parameter exceptions
5	Data not found
6	Already exists
9	Failed precondition
20	Parse json failed
21	Type or url not supported
22	Method not supported
23	Internal server error
24	Request timeout
25	Gateway EUI not matched

Default RX2/Ping Slot Settings

Channel Plan	RX2 Frequency/Hz	RX2 Datarate	Ping Slot Frequency/Hz	Ping Slot Datarate
CN470	Default: 505300000 Range: 470400000~509700000	Default:0 Range: 0: DR0(SF12,125kHz) 1: DR1(SF11,125kHz) 2: DR2(SF10,125kHz) 3: DR3(SF9,125kHz) 4: DR4(SF8,125kHz) 5: DR5(SF7,125kHz) 6: DR6(SF7,500KHz)	Default: 508300000 Range: 470400000~509700000	Default:2 Range: 0: DR0(SF12,125kHz) 1: DR1(SF11,125kHz) 2: DR2(SF10,125kHz) 3: DR3(SF9,125kHz) 4: DR4(SF8,125kHz) 5: DR5(SF7,125kHz) 6: DR6(SF7,500KHz)
EU868	Default: 869525000 Range: 863000000~870000000	Default: 0 Range: 0: DR0(SF12,125kHz) 1: DR1(SF11,125kHz) 2: DR2(SF10,125kHz) 3: DR3(SF9,125kHz) 4: DR4(SF8,125kHz) 5: DR5(SF7,125kHz) 6: DR6(SF7,250KHz)	Default: 869525000 Range: 863000000~870000000	Default: 3 Range: 0: DR0(SF12,125kHz) 1: DR1(SF11,125kHz) 2: DR2(SF10,125kHz) 3: DR3(SF9,125kHz) 4: DR4(SF8,125kHz) 5: DR5(SF7,125kHz) 6: DR6(SF7,250KHz)
IN865	Default: 866550000 Range: 863000000~870000000	Default: 2 Range: 0: DR0(SF12,125kHz) 1: DR1(SF11,125kHz) 2: DR2(SF10,125kHz)	Default: 866550000 Range: 863000000~870000000	Default: 4 Range: 0: DR0(SF12,125kHz) 1: DR1(SF11,125kHz) 2: DR2(SF10,125kHz)

		3: DR3(SF9,125kHz) 4: DR4(SF8,125kHz) 5: DR5(SF7,125kHz)		3: DR3(SF9,125kHz) 4: DR4(SF8,125kHz) 5: DR5(SF7,125kHz)
RU864	Default: 869100000 Range: 864000000~870000000	Default: 0 Range: 0: DR0(SF12,125kHz) 1: DR1(SF11,125kHz) 2: DR2(SF10,125kHz) 3: DR3(SF9,125kHz) 4: DR4(SF8,125kHz) 5: DR5(SF7,125kHz) 6: DR6(SF7,250KHz)	Default: 868900000 Range: 864000000~870000000	Default: 3 Range: 0: DR0(SF12,125kHz) 1: DR1(SF11,125kHz) 2: DR2(SF10,125kHz) 3: DR3(SF9,125kHz) 4: DR4(SF8,125kHz) 5: DR5(SF7,125kHz) 6: DR6(SF7,250KHz)
KR920	Default: 921900000 Range: 920900000~923300000	Default: 0 Range: 0: DR0(SF12,125kHz) 1: DR1(SF11,125kHz) 2: DR2(SF10,125kHz) 3: DR3(SF9,125kHz) 4: DR4(SF8,125kHz) 5: DR5(SF7,125kHz)	Default: 923100000 Range: 920900000~923300000	Default: 3 Range: 0: DR0(SF12,125kHz) 1: DR1(SF11,125kHz) 2: DR2(SF10,125kHz) 3: DR3(SF9,125kHz) 4: DR4(SF8,125kHz) 5: DR5(SF7,125kHz)
US915	Default: 923300000 Range: 923300000~927500000	Default: 8 Range: 0: DR0(SF10,125kHz) 1: DR1(SF9,125kHz) 2: DR2(SF8,125kHz) 3: DR3(SF7,125kHz) 4: DR4(SF8,500kHz) 8: DR8(SF12,500kHz) 9: DR9(SF11,500kHz) 10: DR10(SF10,500kHz) 11: DR11(SF9,500kHz) 12: DR12(SF8,500kHz) 13: DR13(SF7,500kHz)	Default: 923300000 Range: 923300000~927500000	Default: 8 Range: 0: DR0(SF10,125kHz) 1: DR1(SF9,125kHz) 2: DR2(SF8,125kHz) 3: DR3(SF7,125kHz) 4: DR4(SF8,500kHz) 8: DR8(SF12,500kHz) 9: DR9(SF11,500kHz) 10: DR10(SF10,500kHz) 11: DR11(SF9,500kHz) 12: DR12(SF8,500kHz) 13: DR13(SF7,500kHz)
AU915	Default: 923300000 Range: 923300000~927500000	Default: 8 Range: 0: DR0(SF10,125kHz) 1: DR1(SF9,125kHz) 2: DR2(SF8,125kHz) 3: DR3(SF7,125kHz) 4: DR4(SF8,500kHz) 8: DR8(SF12,500kHz) 9: DR9(SF11,500kHz) 10: DR10(SF10,500kHz)	Default: 923300000 Range: 923300000~927500000	Default: 8 Range: 0: DR0(SF10,125kHz) 1: DR1(SF9,125kHz) 2: DR2(SF8,125kHz) 3: DR3(SF7,125kHz) 4: DR4(SF8,500kHz) 8: DR8(SF12,500kHz) 9: DR9(SF11,500kHz) 10:

		11:DR11(SF9,500kHz) 12: DR12(SF8,500kHz) 13: DR13(SF7,500kHz)		DR10(SF10,500kHz) 11:DR11(SF9,500kHz) 12: DR12(SF8,500kHz) 13: DR13(SF7,500kHz)
AS923-1	Default: 923200000 Range: 915000000~92 8000000	Default: 2 Range: 0: DR0(SF12,125kHz) 1: DR1(SF11,125kHz) 2: DR2(SF10,125kHz) 3: DR3(SF9,125kHz) 4: DR4(SF8,125kHz) 5: DR5(SF7,125kHz) 6: DR6(SF7,250KHz)	Default: 923400000 Range: 915000000~92 8000000	Default: 3 Range: 0: DR0(SF12,125kHz) 1: DR1(SF11,125kHz) 2: DR2(SF10,125kHz) 3: DR3(SF9,125kHz) 4: DR4(SF8,125kHz) 5: DR5(SF7,125kHz) 6: DR6(SF7,250KHz)
AS923-2	Default: 921400000 Range: 915000000~92 8000000	Default: 2 Range: 0: DR0(SF12,125kHz) 1: DR1(SF11,125kHz) 2: DR2(SF10,125kHz) 3: DR3(SF9,125kHz) 4: DR4(SF8,125kHz) 5: DR5(SF7,125kHz) 6: DR6(SF7,250KHz)	Default: 921600000 Range: 915000000~92 8000000	Default: 2 Range: 0: DR0(SF12,125kHz) 1: DR1(SF11,125kHz) 2: DR2(SF10,125kHz) 3: DR3(SF9,125kHz) 4: DR4(SF8,125kHz) 5: DR5(SF7,125kHz) 6: DR6(SF7,250KHz)
AS923-3	Default: 916600000 Range: 915000000~92 8000000	Default: 2 Range: 0: DR0(SF12,125kHz) 1: DR1(SF11,125kHz) 2: DR2(SF10,125kHz) 3: DR3(SF9,125kHz) 4: DR4(SF8,125kHz) 5: DR5(SF7,125kHz) 6: DR6(SF7,250KHz)	Default: 916800000 Range: 915000000~92 8000000	Default: 2 Range: 0: DR0(SF12,125kHz) 1: DR1(SF11,125kHz) 2: DR2(SF10,125kHz) 3: DR3(SF9,125kHz) 4: DR4(SF8,125kHz) 5: DR5(SF7,125kHz) 6: DR6(SF7,250KHz)
AS923-4	Default: 917300000 Range: 915000000~92 8000000	Default: 2 Range: 0: DR0(SF12,125kHz) 1: DR1(SF11,125kHz) 2: DR2(SF10,125kHz) 3: DR3(SF9,125kHz) 4: DR4(SF8,125kHz) 5: DR5(SF7,125kHz) 6: DR6(SF7,250KHz)	Default: 917500000 Range: 915000000~92 8000000	Default: 2 Range: 0: DR0(SF12,125kHz) 1: DR1(SF11,125kHz) 2: DR2(SF10,125kHz) 3: DR3(SF9,125kHz) 4: DR4(SF8,125kHz) 5: DR5(SF7,125kHz) 6: DR6(SF7,250KHz)

-End-