

# MQTT Protocol

## Revision History:

Date	Updated by	Description
2021/3/12	Yang Guo	Initial version

## 1 Overview

### 1.1 Topics defined

#### **topic/face/capture/request/{deviceno}**

Device publishes real-time capture record to this topic, e.g., topic/face/capture/request/0123F6-DEFAB2-4D65EE.

#### **topic/face/capture/response/{deviceno}**

Device subscribes to this topic to receive ack of the real-time capture record published above. e.g., topic/face/capture/response/0123F6-DEFAB2-4D65EE.

#### **topic/face/manage/request/{deviceno}**

Device subscribes to this topic to receive configure and control request, e.g., topic/face/manage/request/0123F6-DEFAB2-4D65EE.

#### **topic/face/manage/response/{deviceno}**

Device publishes the response to configure and control request received above to this topic, e.g., topic/face/manage/response/0123F6-DEFAB2-4D65EE.

### 1.2 Conventions

1. The line starts with '#' is comment.
2. String should be utf-8 encoded.
3. The unit of position and size are pixels.
4. String inside json is case sensitive.
5. All fields are required unless specified otherwise.
6. New key/value pair may be add to json in future releases. Some deserialization library in some programming language might throw exception when the undefined key/value pair are encountered. For example, [Jackson](#) in java language.

#### 1.2.1 General Response Format

```
{  
  # The ack flag  
  "reply": "ACK",  
  
  # The command that triggers the response
```

```

    "cmd": "request persons",

    # Ack code
    # 0: success; other value: the error code
    # In the case of error, an optional 'desc' key maybe included to carry the error message
    "code": 0,

    # Device SN
    "device_sn": "0123xx-xxxx-xxxxEE",

    # Commad specific info follows
}

```

### 1.3 Error Code

- 0: Request successfully processed
- 1: Protocol version mismatch
- 2: Server does not contain the service corresponding to the request
- 3: The request packet contains an illegal field
- 4: Authentication failed
- 5: System busy
- 6: Insufficient resources
- 7: System function authorization failure
- 8: System functionality has been Authorization
- 9: Upgrade package mismatch
- 10: File download failed
- 11: File integrity check failed
- 12 to 19: Reserved
- 20: Data entry reaches upper limit
- 21: Record already exists
- 22: Record does not exist
- 23: Failed to write data
- 24: Failed to read data
- 25: Failed to extract feature values
- 26: Portrait quality does not meet registration requirements
- 30: Wigenka does not support fuzzy matching
- 35: Image decoding failed
- 36: The image is too large to extract features from, cannot exceed 10MB
- 37: Image Normalization failed
- 38: Face size is too small
- 39: The quality of portraits is too poor
- 40: The number of faces in the image is not 1
- 41: The face in the image is incomplete

16: Face repetition (the same face was found to already exist in the library when registered)

## 1.4 Enums

```
// OSD items
enum LcdDisplayItem {
    Title = 0x1, // title
    Time = 0x1<<1, // time
    Ip = 0x1<<2, // IP
    RegNum=0x1<<3, // registered faces count
    SN=0x1<<4, // device SN
    Wiegand=0x1<<5, // Wiegand card number
    FourG=0x1<<6, // 4G signal
    RecoNum=0x1<<7// count of body temperature measurements
};
```

## 2 Commands

### 2.1 Face database management

#### 2.1.1 Query registered faces

- Request

```
{
    # command
    "cmd": "request persons",

    # category, 0: normal, 1: whitelisted, 2: blacklisted, -1: all
    "role": -1,

    # 1-based page number
    "page_no": 1,

    # page size, max 20
    "page_size": 10,

    # value indicating whether include normalization image in the result (optional)
    # 0: exclude (default), 1: include
    "normal_image_flag": 1,

    # value indicating whether include image in the result
    # 0: exclude, 1: include
```

```

"image_flag": 0,

# matching mode (optional)
# 0: exact, 1: fuzzy
"query_mode": 0,

# criteria (optional)
"condition": {
    # person id (optional)
    "person_id": "0001",

    # name (optional)
    "person_name": "jack",

    # 32-bit Wiegand Number (mutually exclusive with "long_card_no", optional)
    # doesn't support fuzzy match
    "wg_card_no": 8,

    # 64-bit Wiegand Number (mutually exclusive with "wg_card_no", optional)
    # doesn't support fuzzy match
    "long_card_no": 18446744073709551615,

    # lower bound of valid from time range, must co-exists with "time_start_end" (optional)
    # "useless" value means ignore this value
    "term_start_start": "2017/01/01 00:00:00",

    # upper bound of valid from time range, must co-exists with "time_start_start" (optional)
    # "useless" value means ignore this value
    "term_start_end": "2020/01/01 00:00:00",

    # lower bound of valid to time range, must co-exists with "term_end" (optional)
    # "never": already expired, "forever": never expire
    "term_start": "2017/01/01 00:00:00",

    # upper bound of valid to time range, must co-exists with "term_start" (optional)
    # "never": already expired, "forever": never expire
    "term_end": "2020/01/01 00:00:00"
}
}

```

## ● Response

```

{
  "reply": "ACK",

```

```
"cmd": "request persons",

"code": 0,

"device_sn": "01231B-87182C-C1C6EE",

# the following exists when code = 0

# total count of registered faces
"total": 2000,

# 1-based page number
"page_no": 1

# the count of records
"count": 3

# data in the page
"persons": [
  {
    # ID
    "id": "0001",

    # name
    "name": "XiaoMing",

    # category
    "role": 1,

    # gate access control rule number
    # 0-15, 0: n/a, non-zero: rule number
    "kind": 0,

    # a single feature data size
    "feature_unit_size": 128,

    # features count, max 5
    "feature_num": 1,

    # feature data array, size = feature_unit_size * feature_num
    "feature_data": [
      1.0,
      ...
    ]
  }
]
```

```
],

# count of images
"image_num": 1,

# registered image
"reg_images ": [
  {
    # format
    "format": "jpg",

    # image data, base64 encoded
    "image_data": "...",
  },
  ...
],

# count of normalization image
"normal_image_num": 1,
# normalized images array
"normal_images ": [
  {
    # format
    "format": "jpg",

    # image data, base64 encoded
    "image_data": "...",
  },
  ...
],

# 32-bit Wiegand card number
"wg_card_id": 8,

# 64-bit Wiegand card number, wg_card_id and long_card_id are mutually exclusive
"long_card_id": 18446744073709551615,

# valid from time (optional)
# if the value is "useless", it means n/a
"term_start": "2017/11/10 12:00:00",

# valid to time
# "forever": never expire; "never": already expired
"term": "2017/12/18 16:45:30",
```

```

        # user defined info when register
        "customer_text":"uuid"
    },
    ...
]
}

```

## 2.1.2 Register Face

### ● Request

```

{
  "cmd": "upload person",

  # id, length must be <= 19 english character
  "id": "0001",

  # the following section are optional
  # if images are omitted, the person can access the gate only by id card or Wiegand card
  # if Wiegand card number is omitted, the person can access the gate only by id card
  # in the case of update, the old value will be overwiten

  # name, max 63 bytes, optional when update
  "name": "XiaoMing",

  # category, 1: whitelisted (default); 2: blacklisted
  "role": 1,

  # gate access control rule number
  # 0-15, 0: n/a (default), non-zero: rule number

  "kind": 0,

  # the image, base64 encoded
  # jpg and png are supported. Jpg image must be < 4MB, and the resolution should be <= 2
  million pixels
  "reg_image": "/9j/4AAQSkZJRgABAQAAQABAAD/...",

  # 32-bit Wiegand card number
  # used with 26 bit and 34 bit Wiegand reader
  "wg_card_id": 8,

  # 64-bit Wiegand card number
  # used with 37 bit and 66 bit Wiegand reader
  "long_card_id": 18446744073709551615,

```

```

# valid from time
"term_start": "2017/11/10 12:00:00",

# valid to time
# "forever": never expire; "never": always expired
"term": "2017/12/18 16:45:30",

# user defined info, max 67 bytes
"customer_text": "",

# the following section are for advanced user
# normalized image, this value has higher priority than "reg_image".
# normalized image are preprocessed ones that are faster for registration.
# normalized image can be get by api call or from registered camera.
"normal_image": "",

# the action to take. 0: auto (default), 1: register, 2: update
# auto: update if the id already exists otherwise register
# in the case of register, if the id exists, error occurs
# in the case of update, if the id doesn't exists, error occurs
"upload_mode": 1,

# thumbnail image for OSD display, base64 encoded, jpg format
# if omitted, it will be generated automatically from "reg_image"
"thumb_image": "/9j/4AAQSkZJRgABAQAAQABAAD/..."
}

```

## ● Response

```

{
  "reply": "ACK",

  "cmd": "upload person",

  "code": 0,

  "device_sn": "01231B-87182C-C1C6EE",

  # id in the request
  "id": "0001"
}

```



### 2.1.3 Delete Registration

#### ● Request

```
{  
  "cmd": "delete person(s)",  
  
  # action  
  # -1: delete by id  
  # 0: delete all normal  
  # 1: delete all whitelisted  
  # 2: delete all blacklisted  
  # 3: delete all  
  "flag": 1,  
  
  # id to delete  
  "id": "0001"  
}
```

#### ● Response

```
{  
  "reply": "ACK",  
  
  "cmd": "delete person(s)",  
  
  "code": 0,  
  
  "device_sn": "01231B-87182C-C1C6EE",  
  
  # id deleted  
  "id": "0001"  
}
```

## 2.2 Capture record

### 2.2.1 Real-time capture record publish

#### ● Publish

```
{  
  "cmd": "face",
```

```
# sequence number
"sequence_no": 1,

# device number
"device_no": "0001",
# device SN
"device_sn": "000001-000002-0000BC",

# position number
"addr_no": "0001",

# position name
"addr_name": "some road",

# capture time
"cap_time": "2017/12/18 16:45:30.003",

# realtime flag
"is_realtime": 1,

# access denial reason
# exists when match succeed, but access denied
# -2: restricted person, -3: expired, -4: not in schedule, -5: holiday, -6: temperature too high, -
7:no mask, -8: no safety helmet, -9: card number not registered, -10: id and person mismatch, -11:
unauthorized
"match_failed_reson":0,

# match score
# 0: match not performed; -1: match failed; any value > 0: score (max 100)
"match_result": 80,

# match info
"match":
{
# encryption flag, only id and name are encrypted, the value is base64 encoded encrypted
binary data
"is_encryption":false,

# id
"person_id": "0001",

# name
"person_name": "XiaoMing",
```

```
# category
"person_role": 1,

# register image format
"format": "jpg",

# register image data in base64 format
"image": "...",

# register source
# "none": n/a, "software": software, "cluster": auto registered,
# "sync": cloud, "unknown": unknown source
"origin ": "software",

# registration expiry
# "none": n/a, "permanent_list": never expire
# "temporary_list": will expire, "invalid_list": expired, "unknown": unknown
"person_attr": "permanent_list",

# user defined info
"customer_text": "uuid"
},

# full image existence flag
"overall_pic_flag": true,

# full image, if overall_pic_flat = true
"overall_pic":
{
  # format
  "format": "jpg",

  # image data in base64 format
  "data": "...",

  # x-coordinate of face inside full image
  "face_x": 150,

  # y-coordinate of face inside full image
  "face_y": 150,

  # width of face
  "face_width": 200,
```

```
# height of face
"face_height": 200
},

# close-up existence flag
"closeup_pic_flag": true,

# close-up image data
"closeup_pic":
{
  # format
  "format": "jpg",

  # image data in base64 format
  "data": "...",

  # x-coordinate of face inside close-up
  "face_x": 0,

  # y-coordinate of face inside close-up
  "face_y": 0,

  # width of face
  "face_width": 200,

  # height of face
  "face_height": 200
},

# video existence flag
"video_flag": true,

# video data, if video_flag = true
"video":
{
  # start time
  "start_time": "2017/12/18 16:45:30.003",

  # end time
  "end_time": "2017/12/18 16:45:32.003",

  # format, avi or mp4
  "format": "mp4",
```

```
    # video data in base64 format
    "data": "...",
  },

# person info
"person":
{
  # gender, possible value: male, female and none. "none" means n/a
  "sex": "male",

  # age, 0 means n/a
  "age": 24,

  # safety helmet
  # "none": no helmet; other value: white, blue, orange, red, yellow – the color of helmet
  "hat": "none",

  "temperatur": 36.9,

  # mask flag
  "has_mask": true,

  # face image quality (0-100)
  "face_quality": 70,

  # face to camera angle (-90-90)
  "turn_angle": 0,

  # face to camera rotation angle (-90-90)
  "rotate_angle": 0,

  # 32-bit Wiegand card number
  "wg_card_id": 8,

  # 64-bit Wiegand card number, mutually exclusive with wg_card_id
  "long_card_id": 18446744073709551615
},

# id card info
"id_card": {
  # id number
  "number": "511xxx",

  # name
```

```
"name": "xxxx",

# date of birth
"birthday": "19801001",

# gender, male or female
"sex": "male",

# nationality
"national": "xx",

# address
"residence_address": "xxxx",

# issuing authority
"organ_issue": "xxx",

# valid from
"valid_date_start": "20051001",

# valid to
"valid_date_end": "20151001"
},

# qr code, exists only if qr code is detected
"qr_code": {
  # qr code type
  "qr_type": "QR-Code",

  # qr code data
  "qr_data": "admin"
},

# location, only if positioning module is installed
"gps": {
  # longitude
  "n": "...",
  # latitude
  "e": "...",
  # count of satellites
  "strength": 0
}
}
```

## ● Response to publish

Note: The server must reply as follows. If the device doesn't get the reply or the code is NOT equal to 0, it will resend the record again and again until it receives a success reply, thus device stucks.

```
{
  "reply": "ACK",

  "cmd": " face ",

  # error code (0: success)
  "code": 0,

  # the sequence number the response is for (must be exactly the same as the publish)
  "sequence_no": 1,

  # capture time (must be exactly the same as the publish)
  "cap_time": "2017/12/18 16:45:30.003",

  # gate access control (optional, online mode only)
  "gateway_ctrl": {
    # device type. "gpio": io device, "wiegand": Wiegand device
    "device_type": "gpio",

    # io port number, if "device_type" = "gpio"
    # Wiegand card number, if "device_type" = "wiegand"
    "device_no": 1,

    # long Wiegand card number, for wg36、wg44、wg66 protocol
    # to use this field, "device_no" must be 0
    "long_card_id": 9223372036854775807,

    # action mode.
    # "test": test only, no record of gate opening is generated
    # "force": force output of the signal
    # "scene": output of signal is controlled by whether the device is enabled
    "ctrl_mode": "force",

    # person id. Online mode only, used to generate gate opening record
    "person_id": "0001"
  },
  # tts to play (optional)
```

```

"tts":{
    # the content (utf8 encoding, <= 64 characters)
    "text":"welcome"
},
# text to display on screen (optional)
"text_display":{
    "position":{
        "x":0,
        "y":500
    },
    # display time in millisecond
    "alive_time": 1000,
    "font_size": 100,
    "font_spacing": 1,
    "font_color": "0xffffffff",
    "text": "hello"
}
}

```

## 2.2.2 Historical record query

### ● Request

```

{
    "cmd":"request records",
    # 1-based page number
    "page_no":2,
    # page size (max 20)
    "page_size":20,
    # whether include closeup (0: no, 1: yes)
    "face_image_flag":1,
    # whether include registering image (0: no, 1: yes)
    "reg_image_flag":0,

    # the following are optional

    # time range, the time is in unix time stamp format (seconds from Epoch time)
    # optional, time_start and time_end must exist both or neither
    "time_start":1597856461,
    "time_end":1597885261,
    # confidence score range
    # optional, score_start and score_end must exist both or neither
    "score_start":85,
    "score_end":92,

```



```

# upload state (1: uploaded, 0: not uploaded)
"upload_state":0

# whether do fuzzy query, applies to id and name only, optional
# 0: no (default), 1: yes
"fuzzy_flag":0,
"id":"linxing",
"name":"mike"
}

```

## ● Response

```

{
  "cmd": "request records",
  "code": 0,
  "reply": "ACK",
  "device_sn": "01231B-87182C-C1C6EE",

  # records count of current page
  "count": 20,
  # 1-based page number
  "page_no": 1,
  # total count of matches
  "total": 4379,
  # data of current page
  # the following are two example records, first one is a successful face match, and the second
  one is a failed face match
  # some field doesn't exist for failed face match
  # note: even image is enabled to include in the result, it may or may NOT be included in the
  query result
  "records": [
    {
      "body_temp": 36.303585052490234,
      "customer_id": "",
      "id": "YunZhongShuangYue",
      "match_failed_reson": 0,
      "match_type": 1,
      "name": "mike",
      "person_name_ext": "",
      "reg_image": "/9j/4AAQSkZJRgABAQAAQABAAD/。。。",
      "role": 1,
      "score": 94,
      "sequence": 34894,
      "time": "2020/06/05 11:51:18.454",

```

```

        "upload_state": 1
    },
    {
        "body_temp": 36.335811614990234,
        "match_failed_reson": -11,
        "match_type": 0,
        "score": -1,
        "sequence": 34903,
        "time": "2020/07/01 17:14:18.116",
        "upload_state": 0
    },
    . . .
]
}

```

### 2.2.3 Delete historical record

#### ● Request

```

{
  "cmd": "delete record",
  # the sequence number of the record to be deleted
  # to delete all records, pass 0
  "sequence": 1
}

```

### 2.2.4 Response

```

{
  # ack flag
  "reply": "ACK",

  # the command
  "cmd": "delete record",

  # error code (0: success)
  "code": 0,

  # device SN
  "device_sn": "01231B-87182C-C1C6EE",
}

```

## 2.3 Device configure

### 2.3.1 Get configure

- Request

```
{  
  # the command  
  "cmd": "request app params"  
}
```

- Response

```
{  
  # ack flag  
  "reply": "ACK",  
  
  # the command  
  "cmd": "request app params",  
  
  # error code (0: success)  
  "code": 0,  
  
  # device SN  
  "device_sn": "01231B-87182C-C1C6EE",  
  
  "device_info": {  
    # device number  
    "device_no": "0001",  
  
    # position number  
    "addr_no": "0001",  
  
    # position name  
    "addr_name": "some road"  
  },  
  
  # external networking  
  "extranet": {  
    # enable or not  
    "enable": true,  
  
    # the following exists only when “enable” = true  
    # mode, http or tcp (default)
```

```
"mode": "http",

# server ip
"server_ip": "192.168.0.23",

# server domain name (http mode only)
# if both server_ip and server_domain are provided, server_ip has a higher priority
"server_domain": "a.b.com",

# server port number
"server_port": 2001,

# server url (http mode only)
"url": ""
},

# upload control
"upload_info": {
  # method. Options: http, tcp, ftp, webservice, none
  "method": "http",

# the following exists if method is NOT "none"
  # server ip
  "server_ip": "192.168.0.172",

  # server domain name (http mode only)
  # if both server_ip and server_domain are provided, server_ip has a higher priority
  "server_domain": "some.domain.com",

  # server port number
  "server_port": 2000,

  # server url (length < 102 character, http and webservice mode only)
  "service_url": "face.php",

  # user name (ftp only)
  "user": "user",

  # password (ftp only)
  "password": "123",

# upload destination directory, < 70 characters, ftp only
# if ends with '/', the file name part will be generated automatically
```

# if not ends with '/', the file name part is provided. Be careful with the naming to avoid overwrite.

# following variables are supported.

# %ADDR\_NO%: position number

# "%ADDR\_NAME%": position name

# "%DEVICE\_NO%": device number

# "%SEQUENCE%": sequence number

# "%RAND%": random number

# "%PID%": person id

# "%PNAME%": person name

# "%PROLE%": person category, 0: normal, 1: whitelisted 2: blacklisted

# "%Y%": capture year

# "%M%": capture month (2 characters)

# "%D%": capture day (2 characters)

# "%H%": capture hour (2 characters)

# "%M%": capture minute (2 characters)

# "%S%": capture seconds (2 character)

# "%MS%": capture milliseconds (3 characters)

# "%INDEX%": 1-based index of the captured image

"pattern": "/"

},

# face capture control

"face": {

# min. face size

"min\_face\_size":120,

# name mask

"name\_privacy":true,

# face match enable or disable

"enable\_match": true,

# confidence score (70-100), exists if enable\_match = "true"

"match\_score": 70,

# repeated faces reduction

"enable\_dereplication": true,

# interval for repeated faces reduction in second (3-60), exists if enable\_dereplication = "true"

"derep\_timeout": 3,

# image output

# "overall": full image, "closeup": closeup, "both": full image and closeup, "none": no image

```
"pic_form": "closeup",
# output register image
"enable_output_reg": false,

# output feature data
"enable_output_feature": false,

# age
"enable_age": false,

# gender
"enable_sex": false,

# liveness detection
"enable_alive": false,

# enable or disable repeated registration of same face
"enable_same_face_reg": true,

"body_temperature": {

    # enable/disable body temperate measurement
    "enable":true

    # body temperature threshold (no gate open if body temperature is higher than this value)
    "limit":38.0,

    # outdoor mode
    "outdoor":true,

    # multiframe confirmation
    "multi_frame_confir":false,

    # lower bound of legal temperature range
    "range_min":36.0,

    # upper bound of legal temperature range
    "range_max":42.0,

    # temperature correction
    "correction_value":0.25,

    # use Fahrenheit degree
    "fahrenheit_unit":false
```

```
},

"mask":{
    # enable/disable mask detection
    "enable":true,

    # no go if one doesn't wear mask
    "must_wear_mask":true,

    # alarm if one doesn't wear mask
    "no_mask_alarm":true
},
# remote upgrade
"remote_upgrader":{
    "enable":true
}
},
# gate access control
"gate_control":{

    # output mode. "gpio": electric relay, "wiegand": Wiegand
    "output_mode": "gpio"

    # gate access control mode
    # 0: n/a
    # 1: by face recognition
    # 2: by id card
    # 3: by face recognition and id card
    # 4: by Wiegand card
    # 5: by face recognition and Wiegand card
    # 6: by face detection (any face detected)
    # 7: by face recognition and whitelisted or id card and whitelisted
    # 8: by face recognition and id card
    # 9: by Wiegand card, meanwhile take a picture
    # 10: by face recognition or face recognition and id card
    # 11: by id card (the id card number must be in the whitelist)
    # 12: by id card (no matching is performed)
    # 13: by face recognition or id card (no matching is performed)
    # 20: by face recognition or RFID full image

    "gate_mode": 1,

    # working mode. 1: auto, 2: online, 3: offline
    "match_mode": 1,
```

```
# gpio port state. 0: always off, 1: always on
"gpio_state":0,

# gpio close hold time in millisecond (500-5000)
"gpio_retention_time":1000,

# gpio linkage. Output on all relays on successful match
"gpio_linked":false,

# wiegand linkage. Output on all wiegand on successful match
"wg_linked":false,

# wiegand protocol. Options: wg26, wg34
"wg_protocol":"wg26",

# public Wiegand card number (max. 4294967295)
"wg_id_public":8888,

# start value of auto generated wiegand card number (max. 4294967295)
"wg_create_id_begin":1111,

# end value of auto generated wiegand card number (max. 4294967295)
"wg_create_id_end":9999999
},
# led control
"led_control":{
  # 1: always on, 2: auto, 3: always off
  "led_mode": 1,

  # led brightness (1~100)
  "led_brightness": 80,

  # led sensitivity. options: low, mid, high (auto mode only)
  "led_sensitivity": "mid"
},

# display configure
"lcd_control":{
  # title
  "lcd_title": "Face Recognition",

  # led display item. See enum LcdDisplayItem, bitwise OR operator is supported
  # e.g., to display title + time + ip, set 0b 0001 | 0b 0010 | 0b0100 = 0b0111 = 7
```



```
"lcd_display_item": 7,

# whether mirror the lcd display
"led_mirror": true
},

# qr code configure
"qr_code_control":{
  # enable/disable
  "enable":true,

  # scan interval in second (0-255)
  "repeat_interval": 10
},

"name_list":{
  // auto clean expired registration
  "auto_clean":true
},

"auth":{
  // authentication
  // if enabled, the device authenticate client connections
  "enable":false,
  // user name
  "username":"admin",
  // password
  "password":"admin"
},

"remote_upgrader":{
  // enable/disable remote upgrade
  "enable":false,
  // server domain name
  "server_domain": "",
  // server ip (higher priority over server_domain)
  "server_ip": "",
  // server port
  "server_port":80,
  // uri
  "server_uri":""
},

"record":{
  // enable/disable saving capture record to disk
  "save_enable":true,
  // break-point resume upload
```

```

    "resume_enable":true,
    // destination for saving record. TF (sdcard) or EMMC
    "save_path":"TF"
  },
  "ntp":{
    // enable/disable ntp
    "enable":true,
    // sync interval
    "update_cycle":60,
    // server domain name
    "server_domain": "",
    // server ip (higher priority over server_domain)
    "server_ip": ""
  }
}

```

### 2.3.2 Set configure

Note: all fields are optional unless specified otherwise

#### ● Request

```

{
  # the command
  "cmd": "update app params",

  # device info
  "device_info": {
    # device number
    "device_no": "0001",

    # position number
    "addr_no": "0001",

    # position name
    "addr_name": "some road"
  },

  # external networking
  "extranet": {
    # enable or not
    "enable": true,

    # the following exists only when "enable" = true

```

```
# mode, http or tcp (default)
"mode": "http",

# server ip
"server_ip": "192.168.0.23",

# server domain name (http mode only)
# if both server_ip and server_domain are provided, server_ip has a higher priority
"server_domain": "a.b.com",

# server port number
"server_port": 2001,

# server url (http mode only)
"url": ""
},

# upload control
"upload_info": {
  # method. Options: http, tcp, ftp, webservice, none
  "method": "http",

# the following exists if method is NOT "none"
  # server ip
  "server_ip": "192.168.0.172",

  # server domain name (http mode only)
  # if both server_ip and server_domain are provided, server_ip has a higher priority
  "server_domain": "some.domain.com",

  # server port number
  "server_port": 2000,

  # server url (length < 102 character, http and webservice mode only)
  "service_url": "face.php",

  # user name (ftp only)
  "user": "user",

  # password (ftp only)
  "password": "123",

# upload destination directory, < 70 characters, ftp only
```

# if ends with '/', the file name part will be generated automatically  
# if not ends with '/', the file name part is provided. Be careful with the naming to avoid  
overwrite.

# following variables are supported.

# %ADDR\_NO%: position number

# "%ADDR\_NAME%": position name

# "%DEVICE\_NO%": device number

# "%SEQUENCE%": sequence number

# "%RAND%": random number

# "%PID%": person id

# "%PNAME%": person name

# "%PROLE%": person category, 0: normal, 1: whitelisted 2: blacklisted

# "%Y%": capture year

# "%M%": capture month (2 characters)

# "%D%": capture day (2 characters)

# "%H%": capture hour (2 characters)

# "%M%": capture minute (2 characters)

# "%S%": capture seconds (2 character)

# "%MS%": capture milliseconds (3 characters)

# "%INDEX%": 1-based index of the captured image

"pattern": "/"

},

# face capture control

"face": {

# min. face size

"min\_face\_size":120,

# name mask

"name\_privacy":true,

# face match enable or disable

"enable\_match": true,

# confidence score (70-100), exists if enable\_match = "true"

"match\_score": 70,

# repeated faces reduction

"enable\_dereplication": true,

# interval for repeated faces reduction in second (3-60), exists if enable\_dereplication =  
"true"

"derep\_timeout": 3,

# image output

# "overall": full image, "closeup": closeup, "both": full image and closeup, "none": no

image

```
"pic_form": "closeup",  
# output register image  
"enable_output_reg": false,  
  
# output feature data  
"enable_output_feature": false,  
  
# age  
"enable_age": false,  
  
# gender  
"enable_sex": false,  
  
# liveness detection  
"enable_alive": false,  
  
# enable or disable repeated registration of same face  
"enable_same_face_reg": true,  
  
"body_temperature": {  
  
    # enable/disable body temperate measurement  
    "enable": true  
  
    # body temperature threshold (no gate open if body temperature is higher than this value)  
    "limit": 38.0,  
  
    # outdoor mode  
    "outdoor": true,  
  
    # multiframe confirmation  
    "multi_frame_confir": false,  
  
    # lower bound of legal temperature range  
    "range_min": 36.0,  
  
    # upper bound of legal temperature range  
    "range_max": 42.0,  
  
    # temperature correction  
    "correction_value": 0.25,  
  
    # use Fahrenheit degree
```

```
    "fahrenheit_unit":false
  },

  "mask":{
    # enable/disable mask detection
    "enable":true,

    # no go if one doesn't wear mask
    "must_wear_mask":true,

    # alarm if one doesn't wear mask
    "no_mask_alarm":true
  },
  # remote upgrade
  "remote_upgrader":{
    "enable":true
  }
},
# gate access control
"gate_control":{

  # output mode. "gpio": electric relay, "wiegand": Wiegand
  "output_mode": "gpio"

  # gate access control mode
  # 0: n/a
  # 1: by face recognition
  # 2: by id card
  # 3: by face recognition and id card
  # 4: by Wiegand card
  # 5: by face recognition and Wiegand card
  # 6: by face detection (any face detected)
  # 7: by face recognition and whitelisted or id card and whitelisted
  # 8: by face recognition and id card
  # 9: by Wiegand card, meanwhile take a picture
  # 10: by face recognition or face recognition and id card
  # 11: by id card (the id card number must be in the whitelist)
  # 12: by id card (no matching is performed)
  # 13: by face recognition or id card (no matching is performed)
  # 20: by face recognition or RFID full image

  "gate_mode": 1,

  # working mode. 1: auto, 2: online, 3: offline
```

```

"match_mode": 1,

# gpio port state. 0: always off, 1: always on
"gpio_state":0,

# gpio close hold time in millisecond (500-5000)
"gpio_retention_time":1000,

# gpio linkage. Output on all relays on successful match
"gpio_linked":false,

# wiegand linkage. Output on all wiegand on successful match
"wg_linked":false,

# wiegand protocol. Options: wg26, wg34
"wg_protocol":"wg26",

# public Wiegand card number (max. 4294967295)
"wg_id_public":8888,

# start value of auto generated wiegand card number (max. 4294967295)
"wg_create_id_begin":1111,

# end value of auto generated wiegand card number (max. 4294967295)
"wg_create_id_end":999999
},
# led control
"led_control":{
  # 1: always on, 2: auto, 3: always off
  "led_mode": 1,

  # led brightness (1~100)
  "led_brightness": 80,

  # led sensitivity. options: low, mid, high (auto mode only)
  "led_sensitivity": "mid"
},
# display configure
"lcd_control":{
  # title
  "lcd_title": "Face Recognition",

  # led display item. See enum LcdDisplayItem, bitwise OR operator is supported

```

```
# e.g., to display title + time + ip, set 0b 0001 | 0b 0010 | 0b0100 = 0b0111 = 7
"lcd_display_item": 7,

# whether mirror the lcd display
"led_mirror": true
},

# qr code configure
"qr_code_control": {
  # enable/disable
  "enable": true,

  # scan interval in second (0-255)
  "repeat_interval": 10
},

"name_list": {
  // auto clean expired registration
  "auto_clean": true
},

"auth": {
  // authentication
  // if enabled, the device authenticate client connections
  "enable": false,
  // user name
  "username": "admin",
  // password
  "password": "admin"
},

"remote_upgrader": {
  // enable/disable remote upgrade
  "enable": false,
  // server domain name
  "server_domain": "",
  // server ip (higher priority over server_domain)
  "server_ip": "",
  // server port
  "server_port": 80,
  // uri
  "server_uri": ""
},

"record": {
  // enable/disable saving capture record to disk
  "save_enable": true,
```



```

    // break-point resume upload
    "resume_enable":true,
    // destination for saving record. TF(sdcard) or EMMC
    "save_path":"TF"
  },
  "ntp":{
    // enable/disable ntp
    "enable":true,
    // sync interval
    "update_cycle":60,
    // server domain name
    "server_domain": "",
    // server ip (higher priority over server_domain)
    "server_ip": ""
  }
}

```

## ● Response

```

{
  # ack flag
  "reply": "ACK",

  # the command
  "cmd": "update app params",

  # error code (0: success)
  "code": 0,

  # device SN
  "device_sn": "01231B-87182C-C1C6EE",
}

```

### 2.3.3 Reset configure

## ● Request

```

{
  # the command
  "cmd": "reset app params"
}

```

## ● Response

```
{  
  # ack flag  
  "reply": "ACK",  
  
  # the command  
  "cmd": "reset app params",  
  
  # error code (0: success)  
  "code": 0,  
  
  # device SN  
  "device_sn": "01231B-87182C-C1C6EE",  
}
```

### 2.3.4 Get streaming parameter

## ● Request

```
{  
  # the command  
  "cmd": "request stream params"  
}
```

## ● Response

```
{  
  # ack flag  
  "reply": "ACK",  
  
  # the command  
  "cmd": "request stream params",  
  
  # error code (0: success)  
  "code": 0,  
  
  # device SN  
  "device_sn": "01231B-87182C-C1C6EE",  
  
  # imaging parameters  
  "image": {  
    # max exposure (300-9900us)  
    "max_exposure": 4000,  
  }  
}
```

```

# max gain (0-40dB)
"max_gain": 20,

# contrast (0-128)
"contrast": 60,

# saturation (1-255)
"saturation": 110,

# brightness (1-100)
"brightness": 46
},

# video parameter
"video": {
  # bitrate (1024-4096kbps)
  "bitrate": 2048
}
}

```

### 2.3.5 Set streaming parameter

- **Request**

```

{
# the command
"cmd": "update stream params",

# imaging parameter
"image": {
  # max exposure (optional, 300-9900us)
  "max_exposure": 4000,

  # max gain (optional, 0-40dB)
  "max_gain": 20,

  # contrast (optional, 0-128)
  "contrast": 60,

  # saturation (optional, 1-255)
  "saturation": 110,

  # brightness (optional, 1-100)

```

```
    "brightness": 46
  },

  # video parameter
  "video": {
    # bitrate (1024-4096kbps)
    "bitrate": 2048
  }
}
```

### ● Response

```
{
  # ack flag
  "reply": "ACK",

  # the command
  "cmd": "update stream params",

  # error code (0: success)
  "code": 0,

  # device SN
  "device_sn": "01231B-87182C-C1C6EE",
}
```

## 2.3.6 Reset streaming parameter

### ● Request

```
{
  # the command
  "cmd": "reset stream params"
}
```

### ● Response

```
{
  # ack flag
  "reply": "ACK",

  # the command
  "cmd": "reset stream params",
}
```

```
# error code (0: success)
"code": 0,

# device SN
"device_sn": "01231B-87182C-C1C6EE",
}
```

### 2.3.7 Get access control rules

#### ● Overview

1. There can be up to 15 rules. The rule can be configured to work on every day or on specific weekday.

#### ● Request

```
{
# the command
"cmd": "request schedule params"
}
```

#### ● Response

```
{
# ack flag
"reply": "ACK",

# the command
"cmd": "request schedule params",
"code": 0,

# device SN
"device_sn": "012311-35A0DF-78FBEE",

# the rules array. Max 15 rules
"kinds": [
# a single rule
{
# name
"name": "a rule name",

# rule number (1-15)
"kind": 1,
```



```

# a single rule
{
# name
"name": "a rule name",

# rule number (1-15)
"kind": 1,

# mode. Available options: "daily", "weekly"
"mode": "daily",

# configure for each day
"days": [
# configure for a single day
  {
"sections": [
      # time frames
      {
# start time (inclusive)
"start": {
# hour
"hour": 8,
# minute
"minute": 0
},

# end time (exclusive)
"end": {
# hour
"hour": 12,
# minute
"minute": 0
}
}
]
}
]
}
}

```

## ● Response

```

{
# ack flag

```

```
"reply": "ACK",

# the command
"cmd": "update schedule params",

# error code (0: success)
"code": 0,

# device SN
"device_sn": "012311-35A0DF-78FBEE"
}
```

### 2.3.9 Add access control rule

Same as 2.3.8, but add to the end of the rules array, the kinds array size can be 1 to 15.  
cmd is “add schedule kind”

## 2.4 Snapshot

### ● Request

```
{
# the command
"cmd": "snapshot"
}
```

### ● Response

```
{
# ack flag
"reply": "ACK",

# the command
"cmd": "snapshot",

# error code (0: success)
"code": 0,

# device SN
"device_sn": "012311-35A0DF-78FBEE",

"image ":
{
# format
```



```
    "format": "jpg",

    # the image data (base64)
    "image_data": "...",

    # timestamp
    "time_stamp": "2020/01/01 00:00:00"
  }
}
```

## 2.5 Device control

### 2.5.1 GPIO control

#### ● Request

```
{
  # the command
  "cmd": "gpio control",

  # port number
  "port": 1,

  # action. "on": close, "off": open
  # only "on" (close) is supported, off is done automatically by device
  "ctrl_type": "on",

  # action mode.
  # "test": test only, no record of gate opening is generated
  # "force": force output of the signal
  # "scene": output of signal is controlled by whether the device is enabled
  "ctrl_mode": "force",

  # person id. Online mode only, used to generate gate opening record
  "person_id": "0001"
}
```

#### ● Response

```
{
  # ack flag
  "reply": "ACK",
}
```

```
# the command
"cmd": " gpio control",

# error code (0: success)
"code": 0,

# device SN
"device_sn": "012311-35A0DF-78FBEE",
}
```

## 2.5.2 Wiegand device control

### ● Request

```
{
# the command
"cmd": "wiegand control",

# short Wiegand card number, if you use the long Wiegand card number, set this field to 0
"wiegand_card_no": 0,

# long Wiegand card number, for wg36、 wg44、 wg66
"long_card_id": 9223372036854775807,

# action mode.
# "test": test only, no record of gate opening is generated
# "force": force output of the signal
# "scene": output of signal is controlled by whether the device is enabled
"ctrl_mode": "force",

# person id. Online mode only, used to generate gate opening record
"person_id": "0001"
}
```

### ● Response

```
{
# ack flag
"reply": "ACK",

# the command
"cmd": " wiegand control",
```

```
# error code (0: success)
"code": 0,

# device SN
"device_sn": "012311-35A0DF-78FBEE",
}
```

### 2.5.3 Send data to serial port

#### ● Request

```
{
# the command
"cmd": "send serial data",

# port number. 1 or 2
"device_no": 1,

# data to send, integer array
"content": [121, 1, 5, 25, 26]
}
```

#### ● Response

```
{
# ack flag
"reply": "ACK",

# the command
"cmd": "send serial data",

# error code (0: success)
"code": 0,

# device SN
"device_sn": "012311-35A0DF-78FBEE",
}
```

## 2.6 Heartbeat

### ● Request

```
{
  # the command
  "cmd": "heart beat",

  # device ip. Can be empty if the initiator of the request is not camera
  "ip": "192.168.1.88",

  # device SN (maximum 32 characters). Can be empty if the initiator of the request is not camera
  "device_sn": "000001-000002-0000BC",

  # device number (maximum 32 characters). Can be empty if the initiator of the request is not
  camera
  "device_no": "0001",

  # position number (maximum 32 characters). Can be empty if the initiator of the request is not
  camera
  "addr_no": "0001",

  # position name (maximum 96 character). Can be empty if the initiator of the request is not
  camera
  "addr_name": "some road name",

  # gps info (gps capable device only)
  "gps":{
    # latitude
    "n": "...",
    # longitude
    "e": "...",
    # number of GPS satellite
    "strength":0
  }
}
```

### ● Response

```
{
  # ack flag
  "reply": "ACK",

  # the command
```

```
"cmd": "heart beat",

# error code (0: success)
"code": 0,

# device SN
"device_sn": "012311-35A0DF-78FBEE",
}
```

## 2.7 User defined authentication code

### 2.7.1 Get

#### ● Request

```
{
# the command
"cmd": "request customer auth code"
}
```

#### ● Response

```
{
# ack flag
"reply": "ACK",

# the command
"cmd": "request customer auth code",

# error code (0: success)
"code": 0,

# device SN
"device_sn": "012311-35A0DF-78FBEE",

# user defined authentication code (base64)
"customer_auth_code": "AAA"
}
```

## 2.8 System control

### 2.8.1 Get system time

- Request

```
{  
  # the command  
  "cmd": "request date time"  
}
```

- Response

```
{  
  # ack flag  
  "reply": "ACK",  
  
  # the command  
  "cmd": "request date time",  
  
  # error code (0: success)  
  "code": 0,  
  
  # device SN  
  "device_sn": "012311-35A0DF-78FBEE",  
  
  # system time  
  "date_time": "2018/11/23 16:00:00"  
}
```

### 2.8.2 Set system time

- Request

```
{  
  # the command  
  "cmd": "update date time",  
  
  # system time  
  "date_time": "2018/11/23 16:00:00"  
}
```

## ● Response

```
{  
  # ack flag  
  "reply": "ACK",  
  
  # the command  
  "cmd": "update date time",  
  
  # error code (0: success)  
  "code": 0,  
  
  # device SN  
  "device_sn": "012311-35A0DF-78FBEE",  
}
```

### 2.8.3 Reboot

## ● Request

```
{  
  # the command  
  "cmd": "reboot"  
}
```

## ● Response

```
{  
  # ack flag  
  "reply": "ACK",  
  
  # the command  
  "cmd": "reboot",  
  
  # error code (0: success)  
  "code": 0,  
  
  # device SN  
  "device_sn": "012311-35A0DF-78FBEE",  
}
```

## 2.8.4 Restart application

### ● Request

```
{  
  # the command  
  "cmd": "restart application"  
}
```

### ● Response

```
{  
  # ack flag  
  "reply": "ACK",  
  
  # the command  
  "cmd": "restart application",  
  
  # error code (0: success)  
  "code": 0,  
  
  # device SN  
  "device_sn": "012311-35A0DF-78FBEE",  
}
```

## 2.9 Control

### 2.9.1 Get screensaver

#### ● Request

```
{  
  # the command  
  "cmd": "request lcd screensaver"  
}
```

#### ● Response

```
{  
  # ack flag  
  "reply": "ACK",  
  
  # the command  
  "cmd": "request lcd screensaver",  
}
```



```
# error code (0: success)
"code": 0,

# device SN
"device_sn": "012311-35A0DF-78FBEE",

# mode
# "none": no screensaver
# "extinguish": turn off display
# "media": play image or video
"screensaver_mode": "media"
}
```

## 2.9.2 Set screensaver

### ● Request

```
{
# the command
"cmd": "update lcd screensaver",

# mode
# "none": no screensaver
# "extinguish": turn off display
# "media": play image or video
"screensaver_mode": "media"
}
```

### ● Response

```
{
# ack flag
"reply": "ACK",

# the command
"cmd": "update lcd screensaver",

# error code (0: success)
"code": 0,

# device SN
"device_sn": "012311-35A0DF-78FBEE"
}
```

### 2.9.3 Get screensaver media configure

#### ● Request

```
{  
  # the command  
  "cmd": "request lcd media"  
}
```

#### ● Response

```
{  
  # ack flag  
  "reply": "ACK",  
  
  # the command  
  "cmd": "request lcd media",  
  
  # error code (0: success)  
  "code": 0,  
  
  # device SN  
  "device_sn": "012311-35A0DF-78FBEE",  
  
  # screensaver media files (maximum 10)  
  "screensaver_media_list": [  
    {  
      # 1-based index of the file  
      "sequence": 1,  
  
      # file name  
      "media_name": "news1.png",  
  
      # path to the file, see 2.13.1 Download from device  
      "path": "/data_fs/screensaver/NO1.news1.png"  
    },  
    {  
      # 1-based index of the file  
      "sequence": 2,  
  
      # file name  
      "media_name": "news2.png",  
  
      # path to the file, see 2.13.1 Download from device
```

```
    "path": "/data_fs/screensaver/NO2.news2.png"
  }
]
}
```

## 2.9.4 Update screensaver media

### ● Request

```
{
  # the command
  "cmd": "update lcd media",

  # updated media files (maximum 10)
  "screensaver_media_list": [
    {
      # 1-based index of the file
      "sequence": 1,

      # file name
      "media_name": "news1.png"
    }
  ]
}
```

### ● Response

```
{
  # ack flag
  "reply": "ACK",

  # the command
  "cmd": "update lcd media",

  # error code (0: success)
  "code": 0,

  # device SN
  "device_sn": "012311-35A0DF-78FBEE",

  # updated media files (maximum 10)
  "screensaver_media_list": [
```

```

{
  # 1-based index of the file
  "sequence":1,

  # file name
  "media_name": "news1.png",

  # path to the file, see 2.14.1 Download from device
  "path": "/data_fs/screensaver/NO1.news1.png"
}
]
}

```

## 2.9.5 Delete screensaver media

### ● Request

```

{
  # the command
  "cmd": "delete lcd media",

  # the media files to be deleted (max. 10)
  "screensaver_media_list": [
    {
      # 1-based screensaver media index
      "sequence":1,

      # media name
      "media_name": "news1.png"
    },
    {
      # 1-based screensaver media index
      "sequence":2,

      # media name
      "media_name": "news2.png"
    }
  ]
}

```

### ● Response

```

{

```

```

# ack flag
"reply": "ACK",

# the command
"cmd": "delete lcd media",

# error code (0: success)
"code": 0,

# device SN
"device_sn": "012311-35A0DF-78FBEE",

# deleted media files (max. 10)
"screensaver_media_list": [
  {
    # 1-based media index
    "sequence":1,

    # media name
    "media_name": "news1.png"
  },
  {
    # 1-based media index
    "sequence":2,

    # media name
    "media_name": "news2.png"
  }
]
}

```

## 2.9.6 Add OSD text

- **Request**

```

{
  # the command
  "cmd": "text display",
  # encoding. "utf8" (default) and "gb2312" are supported
  "coding_type": "utf8",
  "text_list": [
    {
      # the position of the text
      "position": {
        "x": 0,

```

```
    "y":500
  },
  # text display duration in milliseconds
  "alive_time": 1000,
  "font_size": 100,
  "font_spacing": 1,
  "font_color": "0xffffffff",
  "text":"some text 1"
},
{
  "position":{
    "x":0,
    "y":610
  },
  "alive_time": 1000,
  "font_size": 100,
  "font_spacing": 1,
  "font_color": "0xff00ff00",
  "text":"some text 2 消费成功 100 元"
}
]
}
```

## ● Response

```
{
  # ack flag
  "reply": "ACK",

  # the command
  "cmd": " text display ",

  # error code (0: success)
  "code": 0,

  # device SN
  "device_sn": "012311-35A0DF-78FBEE"
}
```

## 2.9.7 Add OSD image

### ● Request

```
{
  # the command
  "cmd": "image display",
  "position": {
    "x": 0,
    "y": 500
  },
  # image display duration in milliseconds. 0: forever
  "alive_time": 1000,
  # image format, only support: png, jpg
  "format": "jpg",
  # image data, base64 encoded
  "image_data": "...
}
```

### ● Response

```
{
  # ack flag
  "reply": "ACK",

  # the command
  "cmd": " image display ",

  # error code (0: success)
  "code": 0,

  # device SN
  "device_sn": "012311-35A0DF-78FBEE"
}
```

## 2.10 Remote upgrade

### 2.10.1 Query for upgrade

#### ● Request

```
{
  # protocol version
```

```
"version": "0.2",

# the command
"cmd": "ask_upgrade",

# device SN
"device_sn": "000001-000002-0000BC",

# device number (< 32 characters)
"device_no": "0001",

# last upgrade code (used to diagnose last upgrade failure)
"last_upgrade_code": 0,

# current firmware version
"firmware": {
# system type
  "system": "FaceGate",

  # firmware version
  "appversion": "0.10.2beta",

# algorithm version
  "algversion": "HV6.0",

# chip model
  "platform": "HI3516AV200",

# sensor model
  "sensor": "IMX327D",

# motherboard model
  "board": "FSAN_02",

  # camera motor model
  "motor": "RSA",

# lcd model
  "lcd": "LCD_720_576",

# firmware compile time
  "timestamp": "2019-02-28 18:22:01",

}
```



```
}
```

## ● Response

```
{
```

```
  # ack flag
```

```
  "reply": "ACK",
```

```
  # the command
```

```
  "cmd": "ask_upgrade",
```

```
  # error code (0: success)
```

```
  "code": 0,
```

```
  # upgrade type. "none": no upgrade, "normal": normal upgrade, "force": force upgrade (no  
  version check)
```

```
  "upgrade_type": "none",
```

```
  # upgrade file, optional when upgrade_type = "none"
```

```
  "upgrade_file": {
```

```
    # the path to download upgrade file
```

```
    "url": "http://120.88.44.47/upgrade",
```

```
    # md5 of the upgrade file
```

```
    "md5sum": "621b929a45c388c7e5ac4e260ea3dc99"
```

```
  },
```

```
  # new firmware info
```

```
  "firmware": {
```

```
    # system type
```

```
    "system": "FaceGate",
```

```
    # firmware version
```

```
    "appversion": "0.10.2beta",
```

```
  # algorithm version
```

```
    "algversion": "HV6.0",
```

```
  # chip model
```

```
    "platform": "HI3516AV200",
```

```
  # sensor model
```

```
    "sensor": "IMX327D",
```

```
  # motherboard model
```

```
"board": "FSAN_02",

# motor model
"motor": "RSA",

# lcd model
"lcd": "LCD_720_576",

# time of firmware compilation
"timestamp": "2019-02-28 18:22:01"
}
}
```

## 2.11 Audio

### 2.11.1 Play TTS

- **Request**

```
{
# the command
"cmd": "tts play",

# the text to play (only Chinese is supported)
"text": "some text"
}
```

- **Response**

```
{
# ack flag
"reply": "ACK",

# the command
"cmd": " tts play ",

# error code (0: success)
"code": 0,

# device SN
"device_sn": "012311-35A0DF-78FBEE"
}
```

## 2.11.2 Play audio online

### ● Request

```
{
  # the command
  "cmd": "play audio stream",

  # the audio to play
  "audio": {
    # format (only wav format is supported)
    "format": "wav",

    # the audio data in base64 format
    "data": "+uqcOrrsSrssetuMmxvM60AAAA"
  }
}
```

### ● Response

```
{
  # ack flag
  "reply": "ACK",

  # the command
  "cmd": "play audio stream",

  # error code (0: success)
  "code": 0,

  # device SN
  "device_sn": "012311-35A0DF-78FBEE"
}
```

## 2.11.3 Query built-in audios

### ● Request

```
{
  # the command
  "cmd": "browse audio list"
}
```

## ● Response

```
{
  # ack flag
  "reply": "ACK",

  # the command
  "cmd": "browse audio list",

  # error code (0: success)
  "code": 0,

  # device SN
  "device_sn": "012311-35A0DF-78FBEE",

  "audio_list": [
    {
      "audio_no": 0,

      "audio_name": "NO0.pass.wav"
    },
    ...
  ]
}
```

### 2.11.4 Test playing built-in audio

## ● Request

```
{
  # the command
  "cmd": "play audio",

  # audio number
  "audio_no": 0,

  # audio name
  "audio_name": "NO0.pass.wav"
}
Response
{
  # ack flag
  "reply": "ACK",
```

```
# the command
"cmd": "play audio",

# error code (0: success)
"code": 0,

# device SN
"device_sn": "012311-35A0DF-78FBEE"
}
```

## 2.12 Hardware info

### 2.12.1 Get

#### ● Request

```
{
  # the command
  "cmd": "get hardware info"
}
```

#### ● Response

```
{
  "reply": "ACK",
  # the command
  "cmd": "get hardware info",
  # error code (0: success)
  "code": 0,
  # device SN
  "device_sn": "012353-1FF506-A573EE",
  # motherboard info
  "Board": {
    "manu": "FSAN",
    "model": "FSAN_01"
  },
  # processor info
  "Chip": {
    "manu": "HISI",
    "model": "HI3516AV200"
  },
  # Flash info
  "Flash": {
    "manu": "",
```

```

"model": "",
"size": 0
  },
  # 4G info
  "FourG": {
    "moduler_4g": "NO" # "YES" "NO"
  },
  # LCD info
  "Lcd": {
    "manu": "",
    "model": "LCD_WY_720_576",
    "support": [
      "LCD_WY_720_576",
      "LCD_WY_1280x800",
      "LCD_WY_1024x600"
    ]
  },
  # motor info
  "Motor": {
    "manu": "",
    "model": "",
    "type": "RSA"
  },
  # sensor info
  "Sensor": {
    "manu": "SONY",
    "model": "IMX185"
  },
  # wifi info
  "WIFI": {
    "manu": "",
    "model": ""
  }
}

```

### 2.12.2 Set

- **Request**

```

{
  # the command
  "cmd": "set hardware info",
  # LCD info

```

```
"Lcd": {
  "manu": "",
  "model": "LCD_WY_720_576"
},
# 4G info
"FourG": {
  "moduler_4g": "NO" # "YES" "NO"
}
}
```

## ● Response

```
{
# ack flag
"reply": "ACK",

# the command
"cmd": "set hardware info",

# error code (0: success)
"code": 0,

# device SN
"device_sn": "012311-35A0DF-78FBEE",
}
```

## 2.13 File transfer

### 2.13.1 Download from device

#### ● Request

```
{
# the command
"cmd": "download file",

# path to file
"path": "/data_fs/screensaver/NO1.news.png",

# the offset from the start of the file in bytes
"offset": 0,

# the length of the download (max. 10240 bytes)
"size": 10240
}
```

```
}
```

## ● Response

```
{  
  "reply": "ACK",  
  
  # the command  
  "cmd": "download file",  
  
  # error code (0: success)  
  "code": 0,  
  
  # device SN  
  "device_sn": "012311-35A0DF-78FBEE",  
  
  # path to the file  
  "path": "/data_fs/screensaver/NO1.news.png",  
  
  # the total length of the file in bytes  
  "total_size": 1024000,  
  
  # current offset (together with "size" field, can be used to test if it's last packet)  
  "offset": 0,  
  
  # current download size (together with "offset" field, can be used to test if it's last packet)  
  "size": 204800,  
  
  # current data chunk (base64)  
  "data": "...",  
  
  # md5sum of current data chunk  
  "md5sum": "621b929a45c388c7e5ac4e260ea3dc99"  
}
```

### 2.13.2 Upload to device

## ● Request

```
{  
  # the command  
  "cmd": "upload file",
```



```
# destination path
"path": "/data_fs/screensaver/NO1.news.png",

# total length of the file
"total_size": 1024000,

# current offset
"offset": 0,

# size of current chunk in bytes (max. 200kB)
"size": 204800,

# current chunk of data (base64)
"data": "...",

# md5sum of current chunk
"md5sum": "621b929a45c388c7e5ac4e260ea3dc99"
}
```

## ● Response

```
{
  # ack flag
  "reply": "ACK",

  # the command
  "cmd": "upload file",

  # error code (0: success)
  "code": 0,

  # device SN
  "device_sn": "012311-35A0DF-78FBEE",

  # destination path
  "path": "/data_fs/screensaver/NO1.news.png",

  # current offset
  "offset": 0,

  # size of current chunk
  "size": 10240
}
```

## 2.14 Data upload encryption

### 2.14.1 Set configure

- **Request**

```
{
  # the command
  "cmd": "updata aes",
  # original key in base64 format (max. 16 bytes when converted back to binary data)
  "ori_key": "MTIzNDUAAAAAAAAAAAAAAAAA==",
  # enable or disable encryption (optional, if omitted, keep current setting)
  "enable": true,
  # the new key in base64 format (max. 16 bytes when converted back to binary data, optional)
  "new_key": "MTIzNDU="
}
```

- **Response**

```
{
  # ack flag
  "reply": "ACK",
  # the command
  "cmd": " updata aes ",
  # error code (0: success)
  "code": 0,

  # device SN
  "device_sn": "012311-35A0DF-78FBEE"
}
```

### 2.14.2 Get configure

- **Request**

```
{
  # the command
  "cmd": "request aes",
}
```

- **Response**

```
{  
  "version": "0.21",  
  # the command  
  "cmd": "request aes",  
  # error code (0: success)  
  "code": 0,  
  
  # device SN  
  "device_sn": "012311-35A0DF-78FBEE"  
  # current status  
  "enable": true  
}
```

## 2.15 SIP

### 2.15.1 Set sip account

- **Request**

```
{  
  # the command  
  "cmd": "sip register",  
  
  # domain or ip  
  "domain": "192.168.0.12",  
  
  # server port number  
  "port": 7121,  
  
  # user name  
  "username": "0123",  
  
  # password (optional)  
  "password": "123456"  
}
```

- **Response**

```
{  
  # ack flag  
  "reply": "ACK",
```

```
# the command
"cmd": "sip register",

# error code (0: success)
"code": 0,

# device SN
"device_sn": "012311-35A0DF-78FBEE"
}
```

## 2.15.2 Get sip account

### ● Request

```
{
# the command
"cmd": "sip qure register info",
}
```

### ● Response

```
{
# ack flag
"reply": "ACK",
# the command
"cmd": "sip qure register info ",

# domain or ip
"domain": "192.168.0.12",

# server port number
"port": 7121,

# user name
"username": "0123",

# password
"password": "123456"

# error code (0: success)
"code": 0,

# device SN
```

```
"device_sn": "012311-35A0DF-78FBEE"  
}
```

### 2.15.3 Delete sip account

- **Request**

```
{  
  # the command  
  "cmd": "sip unregister",  
}
```

- **Response**

```
{  
  # ack flag  
  "reply": "ACK",  
  # the command  
  "cmd": "sip unregister",  
  
  # error code (0: success)  
  "code": 0,  
  
  # device SN  
  "device_sn": "012311-35A0DF-78FBEE"  
}
```

### 2.15.4 Make sip call

- **Request**

```
{  
  # the command  
  "cmd": "sip call",  
  
  # destination sip account  
  # format: sip:username@domain:port  
  # or by room number: num:0001  
  "url": "sip:192.168.0.188"  
}
```

- **Response**

```
{
  # ack flag
  "reply": "ACK",

  # the command
  "cmd": "sip call",

  # error code (0: success)
  "code":0,

  # device SN
  "device_sn": "012311-35A0DF-78FBEE"
}
```

### 2.15.5 Hangup sip call

- **Request**

```
{
  # the command
  "cmd": "sip hangup"
}
```

- **Response**

```
{
  # ack flag
  "reply": "ACK",

  # the command
  "cmd": "sip hangup",

  # error code (0: success)
  "code":0,

  # device SN
  "device_sn": "012311-35A0DF-78FBEE"
}
```

### 2.15.6 Sip event publish

**Note:** no request, the event will be published by device

#### ● Publish

```
{  
  
# the command  
"cmd": "sip event",  
  
# device number  
"device_no": "0001",  
  
# device SN  
"device_sn": "000001-000002-0000BC",  
  
# position number  
"addr_no": "0001",  
  
# position name  
"addr_name": "some road",  
  
# event. 0: call ended, 1: call started, 2: caller ringing, 3: caller rejected, 4: caller connected,  
5:called, 6: called connected  
"sip_event": 1,  
}
```

### 2.15.7 Add/update room number

**Note:** you can make a sip call in room number format only after the room number has been 注 added

#### ● Request

```
{  
# the command  
"cmd": "sip add roomid",  
# the room number array  
"room id group":[
```

```

    {
        # room number. Must be unique, same room number will be overwritten
        # up to 3 sip accounts can be associated with a room number, they will be tried from sip
account 1 to sip account 3, it stops trying when either one account succeed or all 3 accounts
fails
        "room id":"0001",

        # sip account 1
        "sip num":"sip:192.168.1.180"

        # sip account 2 (optional)
        "sip num 1":"sip:192.168.2.180"

        # sip account 3 (optional)
        "sip num 2":"sip:192.168.3.180"
    },
    ....
]
}

```

## ● Response

```

{
# ack flag
"reply": "ACK",

# the command
"cmd": "sip add roomid",

# count of successful addition/update
"add count": 2,

# error code (0: success)
"code": 0,

# device SN
"device_sn": "0123FE-738B3A-70E3EE"
}

```

### 2.15.8 Get room numbers

## ● Request

```

{

```



```
# the command
"cmd": "sip qure roomid",

# the room number (optional, if omitted all room numbers will be returned)
"room id":"0001",

# fuzzy match (optional, if omitted, exact match)
"fuzzy":true,

# 1-based page number (optional for exact match)
"page_no":1,

# page size (max 500, optional for exact match)
"page_size":500
}
```

## ● Response

```
{
# ack flag
"reply": "ACK",

# the command
"cmd": "sip qure roomid",

# the room number array
"room id group":[
  {
    "room id":"0001",
    "sip num":"sip:192.168.1.180"
    "sip num 1":"sip:192.168.2.180"
    "sip num 2":"sip:192.168.3.180"
  },
  {
    "room id":"00010",
    "sip num":"sip:192.168.1.181"
    "sip num 1":"sip:192.168.2.181"
    "sip num 2":"sip:192.168.3.181"
  }
  ....
]
```

```
# total count
"total": 2,

# error code (0: success)
"code": 0,

# device SN
"device_sn": "0123FE-738B3A-70E3EE"
}
```

### 2.15.9 Delete room number

#### ● Request

```
{

# the command
"cmd": "sip del roomid",

# the room number to delete (if omitted, delete all room number)
"room id group": [
  {
    "room id": "0001"
  },
  {
    "room id": "0002"
  }
]
}
```

#### ● Response

```
{
# ack flag
"reply": "ACK",

# the command
"cmd": "sip del roomid",

# error code (0: success)
"code": 0,

# device SN
```

```
    "device_sn": "0123FE-738B3A-70E3EE"  
}
```

### 2.15.10 Set format for calling by room number

#### ● Request

```
{  
  
    # the command  
    "cmd": "set roomid splice",  
  
    # device position  
    # "wall": the device is positioned at the entrance of the community  
    # "unit": the device is positioned at the entrance of the block of the building  
    "sip type": "wall",  
  
    # connection character ("wall" only, if omitted, connection character will not be used)  
    "splice symbol": "-",  
  
    # max building number length (0-3, "wall" only, if omitted, building number will not be used)  
    "max building num": 3,  
  
    # max block number length (0-3, "wall" only, if omitted, block number will not be used)  
    "max unit num": 3,  
  
    # max room number length (0-5)  
    "max room num": 5  
}
```

#### ● Response

```
{  
    # ack flag  
    "reply": "ACK",  
  
    # the command  
    "cmd": "set roomid splice",  
  
    # error code (0: success)  
    "code": 0,  
  
    # device SN
```

```
"device_sn": "0123FE-738B3A-70E3EE"  
}
```

- **Get format for calling by room number**

- **Request**

```
{  
  # the command  
  "cmd": "get roomid splice"  
}
```

- **Response**

```
{  
  # ack flag  
  "reply": "ACK",  
  
  # the command  
  "cmd": "get roomid splice",  
  
  # device position  
  # "wall": the device is positioned at the entrance of the community  
  # "unit": the device is positioned at the entrance of the block of the building  
  "sip type": "wall",  
  
  # connection character ("wall" only, if omitted, connection character will not be used)  
  "splice symbol": "-",  
  
  # max building number length (0-3, "wall" only, if omitted, building number will not be used)  
  "max building num": 3,  
  
  # max block number length (0-3, "wall" only, if omitted, block number will not be used)  
  "max unit num": 3,  
  
  # max room number length (0-5)  
  "max room num": 5  
  # error code (0: success)  
  "code": 0,  
  
  # device SN  
  "device_sn": "0123FE-738B3A-70E3EE"  
}
```

## 2.16 4G

### 2.16.1 Get 4G status

- Request

```
{  
  # the command  
  "cmd": "request 4g infor"  
}
```

- Response

```
{  
  # the command  
  "cmd": "request 4g infor",  
  
  "reply": "ACK",  
  
  # error code (0: success)  
  "code": 0,  
  
  # device SN  
  "device_sn": "0123FE-738B3A-70E3EE",  
  
  # 4G module status  
  "module_ready": true,  
  
  # SIM status  
  "sim_ready": true,  
  
  # SIM 卡 ICCID  
  "ICCID": "",  
  
  # IMSI  
  "IMSI": "",  
  
  # operator  
  "operator": "China Mobile",  
  
  # RSSI  
  "signal_strength": 0,
```

```

# GPS
"gps": {
    "e": "",
    "n": "",
    "strength": 0
}
}

```

## 2.16.2 4G data usage stats

### ● Request

```

{
# the command
"cmd": "traffic statistics",

# day (optional, if omitted, data usage of whole month will be returned)
# format: start day – end day (optionl)
# e.g.: "1-9": from day one to day nine
# "1-": from day one to current day
# "1": day one only
"day": "1-9",
}

```

### ● Response

```

{
# the command
"cmd": "traffic statistics",

"reply": "ACK",

# error code (0: success)
"code": 0,

# device SN
"device_sn": "0123FE-738B3A-70E3EE",
"statistics":[
    {
        # date of data usage.
        "date": "6-1", #June 1st

```

```

        # data usage in bytes
        # bytes received
        "bytes_rx":1024,

        # bytes transmitted
        "bytes_tx":1024
    },
    {
        # date of data usage, June 2nd
        "date":"6-2",

        # bytes received
        "bytes_rx":1024,

        # bytes transmitted
        "bytes_tx":1024
    }
]
}

```

## 2.17 Volume

### 2.17.1 Set volume

- **Request**

```

{
    "cmd": "camera volume",
    // action. "SET" or "GET"
    "method": "SET",
    // the volume
    "volume": 50
}

```

- **Response**

```

{
    # ack flag
    "reply": "ACK",

    # the command
    "cmd": "camera volume",
    # error code (0: success)
    "code":0,
}

```

```
# device SN
"device_sn": "0123FE-738B3A-70E3EE"
}
```

## 2.17.2 Get volume

### ● Request

```
{
  # the command
  "cmd": "camera volume",
  # action. "SET" or "GET"
  "method": "GET"
}
```

### ● Response

```
{
  # ack flag
  "reply": "ACK",

  # the command
  "cmd": "camera volume",
  # error code (0: success)
  "code": 0,

  # device SN
  "device_sn": "0123FE-738B3A-70E3EE"
  # the volume
  "volume": 50
}
```