# **1. Overview**

This document is to explain how the device communicates with the server. And in which format they communicate. The Command List shows which messages (commands) sent from the server to the device to request data/information from the device.

**Note:**

The device uses ***Epoch & Unix Timestamp***. The Unix epoch (or Unix time or POSIX time or Unix timestamp) is the number of seconds that have elapsed since January 1, 1970 (midnight UTC/GMT), not counting leap seconds (in ISO 8601: 1970-01-01T00:00:00Z).

The ***Byte order*** is related to little-endian in this document. Such as one Uint32\_t a = 0x12345678, then the transmission time in accordance with the byte from low to high order 0x78, 0x56, 0x34, 0x12.

All characters should be recognized as 16-bit HEX as default in this document. The special cases will be stated if other formats used in this document.

In some **Bytes Table** there are values in the specific byte which contains a **Value Table** with **Bit format**. They should be converted to Decimal system to give the value. We will point out all of these in the next version of instruction.

For example: [Flag Table for Call Records 3.1.12 Call Records (0x25) – Bit 4-7](#_3.1.12_Call_Records)

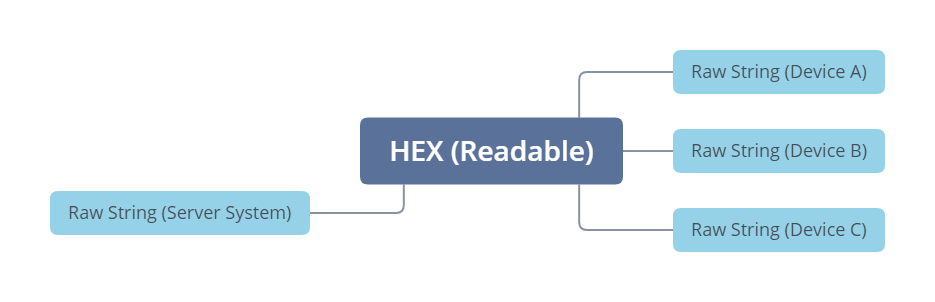
All the **Bit** should be converted from HEX to BIN and compare with its own Bit Table.

The digits ([phone number digits](#_An_example:)) should be converted from HEX to Decimal system one by one. Then checked by the ASCII char table.

In order to ensure the liability of data transmission, the Server must give response if the ***ACK Flag*** bit marked as “1” after receiving the data. Please check the <The ACK Instruction V1> to have the detailed information related to ACK.

A Sequence ID is requested, and it should be the same ID If the ACK is requested.

Both device and server will communicate by raw String. This means a readable text code should be converted from raw String to HEX or in other formats.



# **2. Structure of Message**

Each message include header, properties length, sequence id, check sum and Message body, as shown below:

|  |  |
| --- | --- |
| **Header (0xAB)** | 1 Byte |
| **Properties** | 1 Byte |
| **Length** | 2 Bytes |
| **Checksum** | 2 Bytes |
| **Sequence ID** | 2 Bytes |
| **Message Body** | N Bytes |

## 2.1 Message Header

It takes 1 byte. The initial part of the message should be 0xAB

## 2.2 Message Properties

It takes 1 byte. The properties included:

|  |  |  |
| --- | --- | --- |
| **Encryption** | Bit 7 | 00: Not encrypted |
| Bit 6 | 01: Encrypted by RSA |
| **Error Flag** | Bit 5 | 0: Not Applied |
| 1: Not Applied |
| **ACK Flag** | Bit 4 | 0: ACK not requested |
| 1: ACK requested |
| **Version** | Bit 3 | Default: 0  Not Applied. |
| Bit 2 |
| Bit 1 |
| Bit 0 |
| Note：  Bit 6-Bit 7: The encryption will be only for the Message Body.  Bit 5: Error flag. It’s not used yet.  Bit 0-Bit 3: Protocol version number. Default 0. Not used yet. | | |

## 2.3 Message Length

Message length is the length of the entire [Message Body](#_2.6_Message_Body). It takes 2 bytes. Maximum 1024 bytes.

## 2.4 Checksum

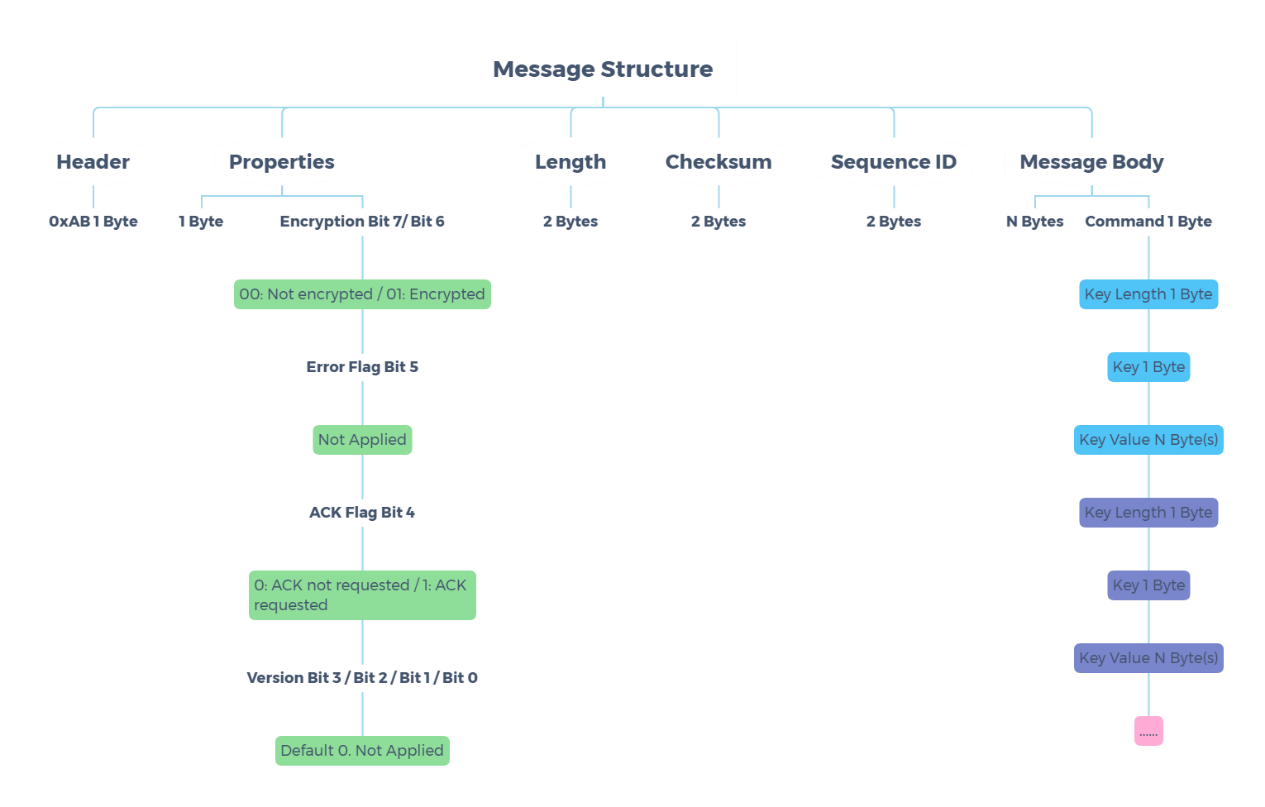
Message checksum [CRC16](#_Appendix_1) for all bytes of the message body. It takes 2 bytes.

## 2.5 Sequence ID

Message sequence ID takes 2 bytes. Starting from 0x0100 after device restarted.

## 2.6 Message Body

|  |  |
| --- | --- |
| Command | 1 Byte |
| Key Length | 1 Byte |
| Key | 1 Byte |
| Key Value | N Byte(s) |
| Key Length | 1 Byte |
| Key | 1 Byte |
| Key Value | N Byte(s) |
| …… | …… |
| Note:  Message Body consists of at least and only one Command and one or more Key Body. Each Key Body consists of Key Length、Key and Key Value.  Key Value should be NULL if Key Length is 1. | |



### An example:

“AB 10 0F 00 EB 7E 01 01 02 0D 30 E0 31 37 35 31 32 30 39 31 32 38 39”

AB -->Header

10 -->Properties

0F 00 -->Length

EB 7E -->Checksum

01 01 -->Sequence ID

*Message Body*

02 -->Command

0D -->Key Length

30 -->Key

E0 -->Function Flag (Set up Authorized Number)

31 37 35 31 32 30 39 31 32 38 39 --> Authorized number: 17512091289

*To get the Phone number digits*

Convert 31 from HEX to Decimal System and we will have 49. Then check the 49th in the ASCII Char list which is ‘1’.

Convert 37 from HEX to Decimal System and we will have 55. Then check the 55th in the ASCII Char list which is ‘7’.

And so on. Then we will have the number ‘17512091289’

ASC II Table:

<http://www.asciitable.com/>

### An example for ACK (check ack instruction to get more details):

The structure of ACK should be a complete message

“AB 10 0F 00 EB 7E 01 01 02 0D 30 E0 31 37 35 31 32 30 39 31 32 38 39”

AB -->Header

10 -->Properties

0F 00 -->Length

EB 7E -->Checksum

01 01 -->Sequence ID

*Message Body*

02 -->Command

0D -->Key Length

30 -->Key

E0 -->Function Flag (Set up Authorized Number)

31 37 35 31 32 30 39 31 32 38 39 --> Authorized number: 17512091289

*To reply the ACK from the server*

AB 00 03 00 08 C7 01 01 7F 01 00

Head: AB

*properties: 00*

*Encryption: 00*

*ERR: N/A*

*ACK: 00*

*Version: 00*

Length: 00 03

CRC: C7 08

Sequence ID: 01 01 (Corresponding Sequence ID)

*Command: 7F (Corresponding command)*

*Key Length: 01*

*Key: 00 (Refer to Negative Response List)*

# **3. Command Table List**

|  |  |  |
| --- | --- | --- |
| **Hex** | **Description** | **Remark** |
| 01 | Data Command | [3.1 Data Command (0x01) Key List](#_3.1_Data_Command) |
| 02 | Configuration | [3.2 Configuration Command (0x02) Key List](#_3.2_Configuration_command(0x02)) |
| 03 | Services | [3.3 Services Command(0x03) Key List](#_3.3_Services_Command(0x03)) |
| 04 | System Control | [3.4 System Control Command(0x04) Key List](#_3.4_System_Control) |
| 7E | Firmware Update | Optional Unfinished |
| 7F | Negative Response |  |
| FE | Factory Test | Optional Unfinished |

## 3.1 Data Command (0x01) Key List

|  |  |  |
| --- | --- | --- |
| **Hex** | **Description** | **Remark** |
| 01 | Device ID | This key should be contained in each data command |
| 02 | Alarm Code | Send this key if there is an alarm |
| 03 | Customized Device ID | A device ID defined by User rather than IMEI Optional |
| 04 | ICCID | Device report inserted SIM ICCID EV206M EV201 Only |
| 10 | Historical data completed | From device to server |
| 11 | Historical data switch | N/A |
| 12 | Single locating | From server to device |
| 13 | Continue locating | From server to device |
| 14 | Walk pet | (PET Only) |
| 15 | Walk pet switch(0x15) | (PET Only) |
| 19 | New Wi-Fi Loc Info | WIFI location with SSID |
| 20 | GPS location |  |
| 21 | Cell Towers (for 2G devices) |  |
| 22 | WI-FI towers |  |
| 23 | BLE Location |  |
| 24 | General data | It contains timestamp, and each uploaded data and each locally saved record must contain this key. (only for locating) |
| 25 | Call Records |  |
| 26 | BLE location2 | (EV04/EV05 Only) |
| 27 | Smart location | (EV04 Only) |
| 28 | Beacon location |  |
| 29 | Cell Towers (for WCDMA/LTE) | (EV07BX/EV04/ EV05 Only) |
| 2A | Home Wi-Fi Location |  |
| 2B | Cell Towers (for WCDMA/LTE) | (EV07BX/EV04/ EV05 Only) |
| 2C | Extend Beacon Location (Battery, Temperature etc.) |  |
| 30 | G-sensor data |  |
| 31 | Activity degree |  |
| 32 | BLE MAC list | (CTM: EV07BX 3104) |
| 33 | Beacon List | (CTM: EV07BX 9101) |
| 34 | Beacon List | (CTM: EV04 0071) |
| 35 | Eddystone-UID Beacons List |  |
| 36 | Private Beacon Events |  |
| 37 | Dog Barking count | (EC208 Only) |
| 38 | GPS Work Percentage | (CTM: EV07BX 0107) |
| 39 | Pedometer Data Extend Walk Time&Step | (CTM:EV06 0122) |
| 40 | Heart Rate data |  |
| 41 | SPO2 Data | (EV06 Only) |
| 60 | BLE HRS for SIG | (CTM: EV07B 4404) |
| 61 | BLE HTS for SIG | (CTM: EV07B 4404) |
| 62 | BLE Peri connect state notice | (CTM:EV07B(X) 4404 4702) |
| 63 | Close Device Information | (CTM: EV07B 35301) |
| 64 | Health Data 3rd Device |  |
| 65 | Menu Uses Time Of Day | (CTM: EV06 0122) |
| 66 | Device Reset Reason | (CTM: EV06 0122) |
| 67 | Sub1G 3rd Device status notice | (EV04S EV12 Only) |
| 68 | Cellular Data Usage | (CTM: EV05 0104/9799) |
| F0 | Internal Use | Internal Use Only |
| Remarks:  1. Multiple data with one Command to be sent at once to the server is allowed. Maximum size of one message is 1KB.  2. The ACK requested data which has returned ACK will be deleted from the device storage. The ACK requested data which has NO returned ACK will be stored to the device storage. And will be proceeded together with new updated data in the next time. | | |

### 3.1.01 Device ID (0x01)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x10 |
| 2 | Key | 0x01 |
| 3-17 | Device ID | It is IMEI, 15 bytes |
| Note: Each data frame must contain a Device ID. And fixed at the first KEY. | | |

### 3.1.02 Alarm Code (0x02)

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** | |
| 1 | Length | 0x05/0x09/0x0D/Extendable | |
| 2 | Key | 0x02 | |
| 3-6 | Alarm Code | Defined by the Alarm Code table below | |
| 7-10 | UTC |  | |
| 11-14 | Alarm Code Extend | Defined by the Alarm Code table below | |
| Alarm Code Table | | | |
| **Bit No.** | **Description** | **Bit No.** | **Description** |
| 0 | Battery-Low Alert | 16 | Battery no charging (充电后就拔CTM:EV07BX\_6103 EC01) |
| 1 | Over Speed Alert | 17 | SOS Ending |
| 2 | Fall-Down Alert | 18 | Amber alert （only ec03） |
| 3 | Tilt Alert | 19 | Welfare alert (check in)（only ec03） |
| 4 | GEO-1 Alert | 20 | Amber alert ending（only EC03） |
| 5 | GEO-2 Alert | 21 | Fall-Down Alert ending（only EC03 EV06） |
| 6 | GEO-3 Alert | 22 | Welfare alert （only EC03） |
| 7 | GEO-4 Alert | 23 | One day upload(CTM: 6103)  SOS cancel (EV07B\_3602) |
| 8 | Power OFF Alert | 24 | Leave home |
| 9 | Power ON Alert | 25 | At home |
| 10 | Motion Alert | 26 | GEO-1 Alert in (When Bit4 is 1, 1-Enter the fence alarm; 0-Exits the fence alarm. When Bit4 is 0, this bit is invalid) |
| 11 | No-Motion Alert | 27 | GEO-2 Alert in(When Bit5 is 1, 1-Enter the fence alarm; 0-Exits the fence alarm. When Bit5 is 0, this bit is invalid) |
| 12 | SOS Alert | 28 | GEO-3 Alert in (When Bit6 is 1, 1-Enter the fence alarm; 0-Exits the fence alarm. When Bit6 is 0, this bit is invalid) |
| 13 | Side Call Button 1  Welfare check in (EC01 Only Special) | 29 | GEO-4 Alert in(When Bit7 is 1, 1-Enter the fence alarm; 0-Exits the fence alarm. When Bit7 is 0, this bit is invalid) |
| 14 | Side Call Button 2  Welfare check out (EC01 Only Special) | 30 | Ble disconnected（Pet Only） |
| 15 | Battery charging (start charging, CTM:EV07BX\_6103) | 31 | Bark detection (Pet Only) |
| Alarm Code Extend | | | |
| **Bit No.** | **Description** | **Bit No.** | **Description** |
| 0 | Watch take away from hand | 16 | GEO Alert with IN/OUT   1. GEO Alert Only 2. GEO IN/OUT Alert Valid |
| 1 | Welfare alert (Check out) |  |  |
| 2 | GEO-5 Alert  (EV05 4411 Only) |  |  |
| 3 | GEO-6 Alert  (EV05 4411 Only) |  |  |
| 4 | GEO-5 Alert in(When Bit2 is 1, 1-Enter the fence alarm; 0-Exits the fence alarm. When Bit2 is 0, this bit is invalid)  (EV05 4411 Only) |  |  |
| 5 | GEO-6 Alert in(When Bit3 is 1, 1-Enter the fence alarm; 0-Exits the fence alarm. When Bit3 is 0, this bit is invalid) (EV05 4411 Only) |  |  |
| 6 | Run step alert (EV07BX\_0107 Only) |  |  |
| 7 | Alert Calling State (CTM:EV06 0122) |  |  |
| 8 | Test Alert (CTM:EV06 0122) |  |  |
| 9 | Test Alert Ending (CTM:EV06 0122) |  |  |

### 3.1.03 Customized Device ID (0x03) Optional

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | N-1 |
| 2 | Key | 0x03 |
| 3-N | Customized ID | An ID to identify the device besides the IMEI |

### 3.1.04 ICCID (0x04) EV206M EV201 Only

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x15 |
| 2 | Key | 0x04 |
| 3-22 | ICCID |  |

### 3.1.10 Historical Data completed (0x10)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x01 |
| 2 | Key | 0x10 |
| This command is to confirm the Historical data has completely sent from the device to the server. | | |

### 3.1.12 Single Locating (0x12)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x01 |
| 2 | Key | 0x12 |
| This command is sent from server to the device to request the device to update the latest location data. | | |

### 3.1.13 Continue Locating (0x13)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x01 |
| 2 | Key | 0x13 |
| This command is sent from server to the device for keep updating the location data with a preset duration. | | |

### 3.1.14 Walk pet(0x14)(PET Only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x09 |
| 2 | Key | 0x14 |
| 3-6 | Start Timestamp | Epoch & Unix Timestamp. 4 bytes |
| 7-10 | Stop Timestamp | Epoch & Unix Timestamp. 4 bytes |

### 3.1.15 Walk pet switch(0x15)(PET Only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x02 |
| 2 | Key | 0x15 |
| 3 | Enable | 0:结束遛狗 1:开始遛狗 |
| This command is sent to device to start or stop walk pet. | | |

### 3.1.19x New Wi-Fi Loc Info(0x19)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 9~(N-1) |
| 2 | Key | 0x19 |
| 3 | RSSI |  |
| 4-9 | MAC | MAC address of the device connects to the base. |
| 10 | Name\_length | Wi-Fi SSID length |
| 11~N | Name | WIFI name (UTF8).(n max 43) |
| Byte 3 to Byte10+n will be repeatedly displaying the Wi-Fi information if more Wi-Fi MACs detected. | | |

### 3.1.20 GPS Location (0x20)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x16 |
| 2 | Key | 0x20 |
| 3-6 | Latitude | Decimal Degrees. Unit: ten millionth of a degree, Signed number.  4 bytes |
| 7-10 | Longitude | Decimal Degrees. Unit: ten millionth of a degree, Signed number.  4 bytes |
| 11-12 | Speed | Unit: KM/H. 2 bytes |
| 13-14 | Direction | Indicates the heading direction.  Unit: Degree. “0” means the North. Range: 0 - 359.  2 bytes |
| 15-16 | Altitude | Unit: meter. 2 bytes |
| 17-18 | Horizontal positioning accuracy | Unit: 1/10. The smaller value indicates more accurate positioning.  Range: 0.5 to 99.9  When the accuracy value is 0, the signal is invalid.  2 bytes |
| 19-22 | Mileage | Unit: meter  Available if using GPS data to calculate. This value is editable.  4 bytes |
| 23 | Number of Satellites | Indicates the number of fixed GPS satellites.  1 byte |

### 3.1.21 Cell Towers (for 2G devices) (0x21)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 1+3+5\*n, n is the number of the covered Cell Towers, and the range is from 1 to 6. |
| 2 | Key | 0x21 |
| 3-4 | MCC |  |
| 5 | MNC |  |
| 6 | RXL |  |
| 7-8 | LAC |  |
| 9-10 | CELLID |  |
| Byte 6 to Byte10 will be repeatedly displaying the Cell Tower information if more Cell Towers detected. | | |

### 3.1.29\* Cell Towers (for WCDMA/LTE)(0x29) (New added) (EV07BX/EV04/ EV05 Only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 1+3+7\*n, n is the number of the covered Cell Towers, and the range is from 1 to 6. |
| 2 | Key | 0x29 |
| 3-4 | MCC |  |
| 5 | MNC |  |
| 6 | RXL |  |
| 7-8 | LAC |  |
| 9-12 | CELLID | 4Bytes |
| Byte 6 to Byte12 will be repeatedly displaying the Cell Tower information if more Cell Towers detected.  This new added Key is to replace the previous Key 3.1.8 Cell Towers (0x21). Since the 3G and 4G Cell-ID will be more than 2 bytes. If you are using 2G and 3G 4G devices at the same time, please add this new Key 0x29. | | |

### 3.1.2B\*\* Cell Towers (for WCDMA/LTE)(0x2B) (New added)(EV07BX/EV04/EV05 Only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 1+4+7\*n, n is the number of the covered Cell Towers, and the range is from 1 to 6. |
| 2 | Key | 0x2B |
| 3-4 | MCC |  |
| 5-6 | MNC | 2Bytes |
| 7 | RXL |  |
| 8-9 | LAC |  |
| 10-13 | CELLID | 4Bytes |
| Byte 7 to Byte13 will be repeatedly displaying the Cell Tower information if more Cell Towers detected.  某些运营商的MNC溢出了，将MNC扩展到2字节 | | |

### 3.1.22 Wi-Fi Towers (0x22)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 1+7\*n, n is the number of Wi-Fi sources (MAC Addresses). |
| 2 | Key | 0x22 |
| 3 | RSSI | The measured current signal strength in dBm. Signed number |
| 4-9 | MAC | The MAC address of the Wi-Fi source. |
| Byte 3 to Byte9 will be repeatedly displaying the Wi-Fi information if more Wi-Fi MACs detected.  The Wi-Fi MAC that uploaded from the device to the server is different from the little-endian, which is big-endian. | | |

### 3.1.23 BLE Location (0x23)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x01 or 0x07 or 0x0f or more |
| 2 | Key | 0x23 |
| 3-8 | MAC | MAC address of the device connects to the base. |
| 9-12 | Latitude | Decimal Degrees. Signed number |
| 13-16 | Longitude | Decimal Degrees. Signed number |
| 17-N | Address description | Describe the location in English. Maximum 32 Bytes |
| The device sends a request to read the BLE location from the connected docking or from connected mobile APP, 0x01+0x23;  If the device has read the preset GPS coordinates from the connected docking or from the connected mobile APP successfully, it returns: 0x0f+0x23+mac+lat+lot;  Otherwise return: 0x7+0x23+mac. | | |

### 3.1.24 General Data(0x24)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Byte No.** | **Parameter** | | **Description** | | |
| 1 | Length | | 0x09 Or 0x0D | | |
| 2 | Key | | 0x24 | | |
| 3-6 | Timestamp | | Epoch & Unix Timestamp. 4 bytes | | |
| 7-10 | Status | | Status of device. 4 bytes  Defined by the Status Table below | | |
| 11～14 | Status2 | | Status of device. 4 bytes  Defined by the Status2 Table below | | |
| Timestamp Calibration Methods | | | Cell network (supported by Cell network) | | |
| GPS (must be calibrated once GPS positioning fixed) | | |
| GPRS (supported by the server) | | |
| BLE (supported by the mobile APP) | | |
| This key must be included in each stored data and each uploaded data. Timestamp must be calibrated as described above. | | | | | |
| Status Table (4 Bytes) | | | | | |
| **Bit No.** | | **Description** | | **Bit No.** | **Description** |
| 0 | | GPS | | 10 | Smart Locating |
| 1 | | Wi-Fi Source | | 11 | Home Beacon location |
| 2 | | Cell Tower | | 12 | BLE Connected |
| 3 | | BLE Location | | 13 | Fall down allow on status (1:open ,0:close)(EC03 Only) |
| 4 | | In-Charging | | 14 | Home wifi location |
| 5 | | Fully Charged | | 15 | Indoor (0:outdoor 1:indoor)  EV05/Pet Only |
| 6 | | Reboot | | 16-18 | Work Mode |
| 7 | | Historical Data | | 19-23 | Cell Network Signal Strength |
| 8 | | AGPS Data Valid | | 24-31 | Battery Level |
| 9 | | Motion | |  |  |
| Signal Strength range 0~31:  To dBm: Strength \* 2 -113  To RSRP: (Strength\*3 – 140) | | | | | |
| Status2 Table (4 Bytes) | | | | | |
| **Bit No.** | | **Description** | | **Bit No.** | **Description** |
| 0～2 | | Mobile network type   1. no service 2. **2G** 3. **3G** 4. **4G** 5. **CAT-M (EV201M/EV206M Only）** 6. **NB-IOT (EV201M/EV206M Only）** | | 16 | Beacon location |
| 3 | | WIFI connected (CTM:EV04 4413) | |  |  |
| 4 | | WIFI upload (CTM: EV04 4413) | |  |  |
| 5 | | OK Status (Reserve bit)   1. Registered 2. Not Registered | |  |  |
| 6 | | Calling status  (EV06 0122 Only) | |  |  |

### 3.1.25 Call Records (0x25)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Description** | **Remark** |
| 1 | Length | (N-1) |
| 2 | Key | 0x25 |
| 3-6 | Timestamp | Epoch & Unix Timestamp. 4 bytes |
| 7 | Flag | Defined by Flag Table below |
| 8-9 | Time |  |
| 10 | Return code |  |
| 11-N | Number | Phone number, n byte |
| Flag Table for Call Records | | |
| Bit 0 | Call Status 1 | 0: Dialing out / 1: Incoming call |
| Bit 1 | Call Status 2 | 0: Answered / 1: Missed |
| Bit 2-3 | Reserved |  |
| Bit 4-7 | Type | 0x00 - Normal Dialing /0000  0x01 - SOS Button Dialing /0001  0x02 - Side Button Dialing /0010  0x03 – Dialing for Alert /0011  0x04 - Call Back /0100  0x05 – Listen-in /0101  0x06 – Auto Answer /0110 |

### 3.1.26 BLE Location 2 (0x26) EV04/EV05 only

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x13 |
| 2 | Key | 0x26 |
| 3-8 | MAC | MAC address of the device scan find nearest. |
| 9-12 | Latitude | Decimal Degrees. Signed number. |
| 13-16 | Longitude | Decimal Degrees. Signed number. |
| 17-18 | Horizontal positioning accuracy | Unit: 1/10 meter. The smaller the value indicates more accurate positioning.  Range: >= 0. |
| 19-20 | Altitude | Unit: meter. Signed number. 2 bytes |

### 3.1.27 Smart Location (0x27) EV04 only

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x0D |
| 2 | Key | 0x27 |
| 3-6 | Latitude | Decimal Degrees. Signed number. |
| 7-10 | Longitude | Decimal Degrees. Signed number. |
| 11-12 | Horizontal positioning accuracy | Unit: meter. The smaller the value indicates more accurate positioning.  Range: >=0 |
| 13-14 | Altitude | Unit: meter, Signed number. 2 bytes |

### 3.1.28 Beacon Location (0x28)

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte No.** | | **Parameter** | **Description** |
| 1 | | Length | 18/(N-1) |
| 2 | | Key | 0x28 |
| 3 | | Flag | Beacon collection information：  Bit6～7：  Bit7: LAT/LNG  Bit6: Beacon description  Bit0~3  Beacon list index 0～15 |
| 4-9 | | MAC | MAC address of the device scan nearest. |
| 10 | | RSSI | The measured current signal strength in dBm. Signed number |
| 11 | | 1M RSSI | The 1meter distance signal strength in dBm. Signed number. This define in beacon |
| 12-15 | | Latitude  (Optional) | **Optional Condition: Flag Bit7=1**  Unit: ten millionth of a degree, Signed number. |
| 16-19 | | Longitude  (Optional) | **Optional Condition: Flag Bit7=1**  Unit: ten millionth of a degree, Signed number. |
| 20~N | | description  (Optional) | **Optional Condition: Flag Bit6=1**  To describe your location in English. Maximum 16Bytes |
| It will be repeatedly displaying the Beacon information from Byte 1 if more beacon MACs detected. | | |

### 3.1.2A Home Wi-Fi Location (0x2A)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 17/(N-1) |
| 2 | Key | 0x2A |
| 3 | Flag | Wi-Fi collection information：  Bit6～7：  Bit7: LAT/LNG  Bit6: Wi-Fi description  Bit0~5: Beacon list index 0～15 |
| 4-9 | MAC | The MAC address of the scanned Wi-Fi sources. |
| 10 | RSSI | The measured current signal strength in dBm. Signed number |
| 11-14 | Latitude | Decimal Degrees. Signed number |
| 15-18 | Longitude | Decimal Degrees. Signed number |
| 19~N | description | To describe your location in English. Maximum 16Bytes |

### 3.1.2C Extend Beacon Location (Battery, Temperature etc.) (0x2C)

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte No.** | | **Parameter** | **Description** |
| 1 | | Length | 20~(N+1) |
| 2 | | Key | 0x2C |
| 3 | | Flag | Beacon collection information：  Bit6～7：  Bit7: LAT/LNG  Bit6: Beacon description  Bit0~3  Beacon list index 0～15 |
| 4-9 | | MAC | MAC address of the device scan nearest. |
| 10 | | RSSI | The measured current signal strength in dBm. Signed number |
| 11 | | 1M RSSI | The 1meter distance signal strength in dBm. Signed number. This define in beacon |
| 12 | | Battery level | The Beacon battery level 0~100 |
| 13-16 | | Latitude  (Optional) | **Optional Condition: Flag Bit7=1**  Unit: ten millionth of a degree, Signed number. |
| 17-20 | | Longitude  (Optional) | **Optional Condition: Flag Bit7=1**  Unit: ten millionth of a degree, Signed number. |
| 21 | | Description length  (Optional) | **Optional Condition: Flag Bit6=1**  The description length |
| 22~N | | description  (Optional) | **Optional Condition: Flag Bit6=1**  To describe your location in English. Maximum 16Byte |
| N+1～N+2 | | Temperature | 摄氏度\*10，Signed number.  Zero is special value, beacon unsupported temperature sensor, server no need to display. |
| It will be repeatedly displaying the Beacon information from Byte 1 if more beacon MACs detected. | | |

### 3.1.30 G-sensor Data (0x30)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | (1+N\*8) |
| 2 | Key | 0x30 |
| 3-6 | Timestamp | Epoch & Unix Timestamp.  4 bytes |
| 7-10 | [Pedometer](http://www.baidu.com/link?url=jygELRxkLqQdYBvJNmrJdYnqEEdhaH59rzswEvWdGOlGr3w5Vh62rh5J-Vpz-fvLtIqlOD5aasYK8abYG2MlLcqwY81ZrEdC1FXiPic8Wqe) | Step counting. 4 bytes.  This will be recorded and analyzed in every hour |
| … | … | …. |
|  | Timestamp | Epoch & Unix Timestamp.  4 bytes |
|  | [Pedometer](http://www.baidu.com/link?url=jygELRxkLqQdYBvJNmrJdYnqEEdhaH59rzswEvWdGOlGr3w5Vh62rh5J-Vpz-fvLtIqlOD5aasYK8abYG2MlLcqwY81ZrEdC1FXiPic8Wqe) | Step counting. 4 bytes.  This will be recorded and analyzed in every hour |
| Support multiple same Keys in a single message | | |

### 3.1.31 Activity (0x31)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | (1+N\*8) |
| 2 | Key | 0x31 |
| 3-6 | Timestamp | Epoch & Unix Timestamp. 4 bytes |
| 7-10 | Activity | Activity analyzing. 4 bytes  This will be recorded and analyzed in every 5 minutes |
| … | …. | …. |
|  | Timestamp | Epoch & Unix Timestamp. 4 bytes |
|  | Activity | Activity analyzing. 4 bytes  This will be recorded and analyzed in every 5 minutes |
| Support multiple same Keys in a single message | | |

### 3.1.32 BLE MAC list (0x32) (CTM:EV07BX 3104)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 5+N\*7 |
| 2 | Key | 0x32 |
| 3-6 | Timestamp | Epoch & Unix Timestamp.  4 bytes |
| 7-12 | MAC | MAC address of the connected docking. |
| 13 | RSSI |  |
|  | MAC | MAC address of the connected docking. |
|  | RSSI |  |

### 3.1.33 Beacon List (0x33) (CTM:EV07BX 9101)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 23+N\*6 |
| 2 | Key | 0x33 |
| 3-6 | Timestamp | Epoch & Unix Timestamp.  4 bytes |
| 7-8 | Company ID | Apple 0x004c |
| 9-24 | iBeacon UUID | MAC address of the connected Beacon. |
| 25-26 | Major |  |
| 27-28 | Minor |  |
| 29 | Measured RSSI | Measured RSSI |
| 30 | RSSI | Read RSSI |
|  | Major |  |
|  | Minor |  |
|  | Measured RSSI | Measured RSSI |
|  | RSSI | Read RSSI |

### 3.1.34 Beacon List (0x34) (CTM:EV04 0071)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 7+N\*22 |
| 2 | Key | 0x34 |
| 3-6 | Timestamp | Epoch & Unix Timestamp.  4 bytes |
| 7-8 | Company ID | Apple 0x004c |
| 9-24 | iBeacon UUID |  |
| 25-26 | Major |  |
| 27-28 | Minor |  |
| 29 | Measured RSSI | Measured RSSI |
| 30 | RSSI | Read RSSI |
|  | iBeacon UUID |  |
|  | Major |  |
|  | Minor |  |
|  | Measured RSSI | Measured RSSI |
|  | RSSI | Read RSSI |

### 3.1.35 Eddystone-UID Beacons List (0x35)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 7+N\*18 |
| 2 | Key | 0x35 |
| 3-6 | Timestamp | Epoch & Unix Timestamp.  4 bytes |
| 7-8 | UUID 16bit | 0xFEAA |
| 9-18 | Namespace ID |  |
| 19-24 | Instance ID |  |
| 25 | Tx power |  |
| 26 | RSSI | Read RSSI |
|  | Namespace ID |  |
|  | Instance ID |  |
|  | Tx power |  |
|  | RSSI | Read RSSI |

### 3.1.36 Private Beacon Events (0x36)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | N-1 |
| 2 | Key | 0x36 |
| 3-6 | Timestamp | Epoch & Unix Timestamp.  4 bytes |
| 7-12 | MAC | MAC address of the connected docking. |
| 13 | RSSI |  |
| 14~.. | Event1 | The Content of Beacon event1 |
|  | …. |  |
| N | Event<T> |  |
| **The detail of Beacon Event** | | |
| **Battery voltage and tempture (**CTM: EV07BX 4602**)** | | |
| 1 | Length | 0x04 |
| 2 | Type | 0x01: Button beacon |
| 3~4 | Battery | Battery voltage, Units: mV |
| 5 | Tempture | Signed number, Units: ℃ |
| **Battery voltage (**CTM: EV07BX 3104**)** | | |
| 1 | Length | 0x02 |
| 2 | Type | 0x02: Button beacon |
| 3 | Battery | Battery percent, 0%～100% |
| **Cur Band Information Data** **(**CTM: EV07BX 4602**)** | | |
| 1 | Length | 0x09 |
| 2 | Type | 0x03: Cur Band Info Key |
| 3~5 | ID0~ID2 | Device ID 24 bits |
| 6 | Type Of Alarm  (TOA)  & Flags | Bit 0-3 is Type Of Alarm (TOA):  0x00 = Alarm  0x01=Check message  ... |
| 7 | Device Type (DTY) | 0x00 = Alarm button  0x01 = Smoke detector  ... |
| 8 | TempH||VbattH |  |
| 9 | Templ |  |
| 10 | TempL |  |
|  |  |  |

### 3.1.37 Dog Barking count(0x37) (EC208 Only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x09/Extendable |
| 2 | Key | 0x37 |
| 3-6 | Time | Unix Timestamp.  4 bytes |
| 7-10 | Status | Bit31  1:stop upload  0:alert continue  Bit0-30  Dog barking count upload |

### 3.1.38 GPS Work Percentage (0x38) (CTM: EV07BX 0107)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x0A/Extendable |
| 2 | Key | 0x38 |
| 3-6 | Last Time | Unix Timestamp.  4 bytes |
| 7-10 | This Time | Unix Timestamp.  4 bytes |
| 11 | Value | GPS work percentage (0~100)  =( Accumulated work seconds)/(This Time – Last Time) |

### 3.1.39 Pedometer Data Extend Walk Time&Step (0x39) (CTM:EV06 0122)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x0D/Extendable |
| 2 | Key | 0x39 |
| 3-6 | Timestamp | Epoch & Unix Timestamp.  4 bytes |
| 7-10 | [Pedometer](http://www.baidu.com/link?url=jygELRxkLqQdYBvJNmrJdYnqEEdhaH59rzswEvWdGOlGr3w5Vh62rh5J-Vpz-fvLtIqlOD5aasYK8abYG2MlLcqwY81ZrEdC1FXiPic8Wqe) | Step counting. 4 bytes.  This will be recorded and analyzed in every hour |
| 11-12 | Walk Time | Unit(s) |
| 13-14 | Walk Step | Step count |
| 设备周期上报累计步数，同时上传周期内步数增量和时间 | | |

### 3.1.40 Heart Rate Data (0x40)(EC02 EV05 EV06 Only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 1+n\*6 |
| 2 | Key | 0x40 |
| 3-6 | Timestamp | Epoch & Unix Timestamp. 4 bytes |
| 7 | Heart Rate | Heart Rate Value:  0: Not Worn  1: Not Detected  Others are the heart rate value |
| 8 | Trust level | Percentage, from 0 to 100 |
| 9-12 | Timestamp |  |
| 13 | Heart rate |  |
| 14 | Trust level | Percentage, from 0 to 100 |
| Support multiple same Keys in a single message | | |

### 3.1.41 SPO2 Data (0x41)(EV06 Only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 1+n\*6 |
| 2 | Key | 0x41 |
| 3-6 | Timestamp | Epoch & Unix Timestamp. 4 bytes |
| 7 | SPO2 Rate  EV06 Only | Heart Rate Value:  0: Not Worn  1: Not Detected  Others are the heart rate value |
| 8 | Trust level | Percentage, from 0 to 100 |
| 9-12 | Timestamp |  |
| 13 | SPO2 rate |  |
| 14 | Trust level | Percentage, from 0 to 100 |
| Support multiple same Keys in a single message | | |

### 3.1.60 BLE HRS for SIG (0x60) (CTM:EV07B 4404)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 1+n\*11 |
| 2 | Key | 0x60 |
| 3-6 | Timestamp | The timestamp is the total number of seconds since January 01, 1970, from 00:00 to 00 seconds.  4 bytes |
| 7 | Heart rate | 1byte |
| 8-11 | RR\_interval | 4 bytes; UNIT: 1/1024 second |
| 12 | Trust level | Trust level percentage from 0～100 |
| 13 | Battery level | 1 byte; 0-100percent |

### 3.1.61 BLE HTS for SIG (0x61) (CTM:EV07B 4404)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 1+n\*10 |
| 2 | Key | 0x61 |
| 3-6 | Timestamp | The timestamp is the total number of seconds since January 01, 1970, from 00:00 to 00 seconds.  4 bytes |
| 7 | flags | Bit0=Temperature Units Flag 0=℃ 1=F  Bit2 =Temperature Type Flag  0=Temperature Type field not present  1 =Temperature Type field present |
| 8-11 | Temperature value | FLOAT format (IEEE-11073 32-bit FLOAT, defined as a 32-bit value with a 24-bit mantissa and an 8-bit exponent)  Example :  (ieee\_float32\_t)0XFE000E1B =0x000E1B\*10^-2=36.11 |
| 12 | Temperature Type | 1=Armpit  2=Body (general)  3=Ear (usually ear lobe)  4=Finger  5=Gastro-intestinal Tract  6 =Mouth  7=Rectum  8=Toe  9=Tympanum (ear drum)  >=10 Reserved |

### 3.1.62 BLE peri connect state notice (0x62) (CTM:EV07B(X) 4404 4702)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x02/0x09 |
| 2 | Key | 0x62 |
| 3 | state | 0= Disconnected, 1= Connected |
| 4-9 | Mac | MAC address of the device scan find nearest（CTM：4702） |
| 10 | Battery Level | 0～100 （CTM：4702） |

### 3.1.63 Close Device Information (0x63) (CTM:EV07B 35301)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x16 |
| 2 | Key | 0x63 |
| 3-6 | Timestamp | 4bytes |
| 7-21 | IMEI | The close device’s IMEI |
| 22 | RSSI\_1M | RSSI value in distance of 1m (int8) |
| 23 | RSSI | RSSI value in fact (int8) |

### 3.1.64 Health Data 3rd Device (0x64)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | (N-1) |
| 2 | Key | 0x64 |
| 3 | Manu ID | 1-jumper |
| 4 | Device Type | 1. SPO2 2. Blood pressure |
| 5-8 | Timestamp | 4bytes |
| 9～N | Content | Detect result content |
| **Jumper SPO2 Content define** | | |
| 1 | Heart rate |  |
| 2 | SOP2 |  |
| 3 | PI |  |
| **Jumper Blood pressure Content define** | | |
| 1 | Systolic |  |
| 2 | Diastolic |  |
| 3 | Pulse |  |

### 3.1.65 Menu Uses Time Of Day(0x65) (CTM: EV06 0122)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x2A/ Extendable |
| 2 | Key | 0x65 |
| 3 | Time Zone | 1 Byte. Signed char. Unit: 15minutes.  Range: -48 to +56 Default: 0 |
| 4-7 | Timestamp | 4bytes |
| 8-11 | Home | Unit(s) |
| 12-15 | Heart rate | Unit(s) |
| 16-19 | Contact  (Reserve) | Unit(s) |
| 20-23 | Weather  (Reserve) | Unit(s) |
| 24-27 | Settings | Unit(s) |
| 28-31 | Blood Oxygen  (Reserve) | Unit(s) |
| 32-35 | Alarm Clock (Reserve) | Unit(s) |
| 36-39 | Walk | Unit(s) |
| 40-43 | Power Off  (Optional : Remind) | Unit(s) |
| Reserve字段暂未使用，上传默认值为0 | | |

### 3.1.66 Device Reset Reason (0x66)（CTM: EV06 0122）

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** | |
| 1 | Length | 0x09/ Extendable | |
| 2 | Key | 0x66 | |
| 3-6 | Timestamp | Epoch & Unix Timestamp. 4 bytes | |
| 7-10 | Reset Reason | Reset reason. 4 bytes  Defined by the Table below  All Bit zero, indicate power-on reset or a brownout reset | |
| Reset reason (4 Bytes) | | | |
| **Bit No.** | **Description** | **Bit No.** | **Description** |
| 0 | Pin-reset detected | 16 | Manual key press power on |
| 1 | Watchdog detected | 20 | USB power on |
| 2 | Soft reset detected |  |  |
| 3 | CPU look-up detected |  |  |

### 3.1.67 Sub1G 3rd Device status notice (0x67) (EV04S EV12 Only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | (N-1) |
| 2 | Key | 0x67 |
| 3 | Manufacturer ID | 1. InstanceCare 2. Eview LORA device |
| 4 | Device Type | 1. Button 2. Docking station 3. Wrist Band 4. Fall Sensor |
| 5-8 | Timestamp | 4bytes |
| 9～N | Content | Detect result content |
| **InstanceCare Button Content define(Manufacturer ID=1, Device Type=1 or 4)** | | |
| 1~4 | Device ID | 4bytes  Bit0~23: Device Type/ Serial Number  Bit24~31: Reserved  Example:  Device Type: 1  Serial Number:23456  Value: 0x56, 0x34, 0x12, 0x00 |
| 5 | RSSI | RSSI value in fact (int8) |
| 6 | Status | Bit 0: Button Press  Bit 1: Fall Trigger  Bit 6: Low Battery |
| **Eview Lora Dock Content define (Manufacturer ID=2, Device Type=2) EV12 Only** | | |
| 1~2 | Device Type | 2bytes  Dock：0x0001(default) |
| 3~6 | Device ID | 4bytes  With range 0x00001 to 0xFFFFFFFF |
| 7 | RSSI | RSSI value in fact (int8) |
| 8 | Status | Bit 0: Short Press Button  Bit 1: Long Press Button  Bit 2: Heartbeat  Bit 3~6: Reserved  Bit 7: Supervisor |
| **Eview Lora Band Content define (Manufacturer ID=2, Device Type=3) EV12 Only** | | |
| 1~2 | Device Type | 2bytes  Band：0x0002(default) |
| 3~6 | Device ID | 4bytes  With range 0x00001 to 0xFFFFFFFF |
| 7 | RSSI | RSSI value in fact (int8) |
| 8 | Status | Bit 0: Short Press Button  Bit 1: Long Press Button  Bit 2: Heartbeat  Bit 3~5: Reserved  Bit 6: Low Battery  Bit 7: Supervisor |

### 3.1.68 Cellular Data Usage (0x68) (CTM:EV05 0104/9799)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | (N-1) |
| 2 | Key | 0x68 |
| 3-6 | Timestamp | Epoch & Unix Timestamp. 4 bytes |
| 7~10 | UID | The UID for system and package |
| 11-14 | Data Usage | Unit: Byte |
| 15~N | Package Name | Package name string, max length=16bytes  Example: “com.eview.ecare” |

### 3.1.F0 Internal Use

## 3.2 Configuration command(0x02) Key List

|  |  |  |
| --- | --- | --- |
| **Hex** | **Parameter** | **Remark** |
| **Systems** | | |
| 01 | [Module Number](#_3.2.01_Module_Number) |  |
| 02 | [Firmware Version](#_3.2.02_Firmware_Version) |  |
| 03 | IMEI |  |
| 04 | ICCID |  |
| 05 | MAC |  |
| 06 | Setting Time |  |
| 07 | Run Times |  |
| 08 | Firmware Information |  |
| 09 | Initialize Mileage |  |
| 0A | Working Mode |  |
| 0B | Alarm Clock |  |
| 0C | No Disturb |  |
| 0D | Password Protect |  |
| 0E | Time Zone |  |
| 0F | Enable Control |  |
| 10 | Ring-Tone Volume |  |
| 11 | Mic Volume |  |
| 12 | Speaker Volume |  |
| 13 | Device name | For BLE connection only |
| 14 | Battery |  |
| 15 | BLE locating |  |
| 16 | Set whitelist device | for docking station |
| 17 | Set SMS GPS URL |  |
| 18 | Set SMS WI-FI/LBS URL |  |
| 19 | Voice Prompt ON/OFF |  |
| 1A | Firmware |  |
| 1B | GSM Module |  |
| 1C | Voice Prompt Volume |  |
| 1D | AGPS Reference Location | EV07B(X) Only |
| 1F | System Language settings | EV04 EV05 Only |
| **Button Setting** | | |
| 20 | SOS button Setting |  |
| 21 | Call 1 button Setting |  |
| 22 | Call 2 button Setting |  |
| **Phone Setting** | | |
| 30 | Set Authorized Number |  |
| 31 | SMS Reply Prefix Text |  |
| 32 | SOS Option |  |
| 33 | Phone Switches |  |
| 34 | Set Authorized Number with name and photo | EV05 Only |
| 35 | Set Personal Data Information | EV05 EV06 Only |
| 36 | Watch Settings | EV05 EV06 Only |
| **GPRS Setting** | | |
| 40 | APN |  |
| 41 | APN User Name |  |
| 42 | APN Password |  |
| 43 | Sever IP &Port |  |
| 44 | Time Interval |  |
| 45 | Continue Locating Time Parameter |  |
| 46 | Heart Rate Interval | EV05 EC02 EV06 Only |
| 47 | Device ID Optional |  |
| 48 | Static AES128 Set Write only |  |
| 49 | Read Static AES128 CRC Read Only |  |
| 4A | WIFI connect network | EV04 EV05 Only |
| 4B | Cat-M Setting | NB eMTC Only |
| 4C | APN Settings | EV04 EV05 EV07B Only |
| 4D | APN Settings query status | EV04 EV05 EV07B Only |
| 4E | GSM Feature band（PET Only） |  |
| 4F | Set Preferred network type（EV05/EV04 Only） |  |
| **Alert Setting** | | |
| 50 | Power Alert |  |
| 51 | GEO Alert |  |
| 52 | Motion Alert |  |
| 53 | No-motion Alert |  |
| 54 | Over speed Alert |  |
| 55 | Tilt Alert |  |
| 56 | Fall Down Alert |  |
| 57 | Welfare Check |  |
| 58 | Alert Notification HTTP API (EV04 only) |  |
| 59 | Motion Detect Settings (EV04 CTM:3903) |  |
| 5A | GEO Alert Detect Settings (EV04/EV05) |  |
| 5B | Step Collect Settings | EV05 Only |
| 5C | Dog Barking Settings (EC208 Only) |  |
| 5D | Alert Level Settings (EV07B CTM:4601) |  |
| 5E | Side Button Alert |  |
| 5F | Home Detect Settings (EV04/EV05 Only) |  |
| 60 | Device Power Information |  |
| 61 | SIM MSISDN |  |
| 62 | WIFI white list |  |
| 63 | Power save | EV06 EC02 Only |
| 64 | Mobile network information |  |
| 65 | Device network status (For App assist connect server) |  |
| 66 | IMSI information Read Only |  |
| 67 | Home WIFI match number (CTM:EV05 0104) |  |
| 68 | Operator Information (Read Only) |  |
| 69 | System Calling settings (CTM: EV04 3304) |  |
| 6A | Weather update settings (CTM: EV05 0102) |  |
| 70 | BLE Scan time | EV07B Only |
| 71 | BLE Scan beacon | EV07B Only |
| 72 | BLE iBeacon UUID | EV07B Only |
| 73 | Set beacon location list |  |
| 74 | Find Me configure (CTM: EV07BX 0107) |  |
| 75 | Extra Enable Control |  |
| 76 | Extra Voice Prompt ON/OFF |  |
| 77 | Run Step Alert Settings（CTM: EV07BX 0107） |  |
| **LED Settings** | | |
| E0 | LED default state EV202 Only |  |
| **Operation** | | |
| 0xF0 | Read | Append keys to Read Only.  Don’t add this key after writing Configuration file. |
| 0xF1 | Internal Use | Internal Use Only |
| 0xF2 | Internal Use | Internal Use Only |
| 0xF3 | Internal Use | Internal Use Only |
| 0xF4 | Internal Use | Internal Use Only |

### 3.2.01 Module Number (0x01) Read Only

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x05 |
| 2 | Key | 0x01 |
| 3-6 | Module Number | (20 01 18 20,2018-01-20) |

### 3.2.02 Firmware Version (0x02) Read Only

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x05 |
| 2 | Key | 0x02 |
| 3-6 | Firmware Version |  |

### 3.2.03 IMEI (0x03) Read Only

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x10 |
| 2 | Key | 0x03 |
| 3-17 | IMEI |  |

### 3.2.04 ICCID (0x04) Read Only

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x15 |
| 2 | Key | 0x04 |
| 3-22 | ICCID |  |

### 3.2.05 BLE-MAC (0x05) Read Only

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x07 |
| 2 | Key | 0x05 |
| 3-8 | BLE-MAC |  |

### 3.2.06 Setting Time (0x06)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x05 |
| 2 | Key | 0x06 |
| 3-6 | Timestamp | Send Time parameter to the device to sync |

### 3.2.07 Run Times (0x07) Read Only

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x05 |
| 2 | Key | 0x07 |
| 3-6 | Runtime | Unit: second. Read only |
| It starts from 0 every time while the device is powered ON. | | |

### 3.2.08 Firmware Information (0x08) Internal Use Only

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x29 |
| 2 | Key | 0x08 |
| 3-6 | Firm Version |  |
| 7-10 | Firmware Size |  |
| 11-14 | Hardware version |  |
| 15-18 | Soft-device version |  |
| 19-22 | Soft-device FWID |  |
| 23-34 | Firmware complier Date | ASCII String |
| 35-42 | Firmware complier Time | ASCII String |
| Firmware information is used for debug purpose only.  Firmware Version: ((VER\_H<<24)|(VER\_M<<16)|(VER\_L<<8)|(VER\_ML))  Firmware Size: uint32\_t  Hardware version: HEX;  Soft-device version: SD\_VERSION (SD\_MAJOR\_VERSION \* 1000000 + SD\_MINOR\_VERSION \* 1000 + SD\_BUGFIX\_VERSION)  Soft-device FWID: HEX  Firmware complier Date: ASCII String  Firmware complier Time: ASCII String | | |

### 3.2.09 Initialize Mileage (0x09)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x05 |
| 2 | Key | 0x09 |
| 3-6 | Mileage | Unit: Meter. Default 0. |

### 3.2.0A Working Mode (0x0A)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x05 |
| 2 | Key | 0x0A |
| 3-5 | Time/Interval (For Locating and for data uploading) | Not Applied if Mode = 1/2/3/6  If Mode=4, value range is  10\*60-60\*60\*24\*7. Default: 60\*60  If Mode=5, value range is 10\*60-60\*60\*24\*7, Default: 1\*60\*60 |
| 6 | Mode | Value range: 1 to 6. Default: 1. |

### 3.2.0B Alarm Clock (0x0B)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Byte No.** | | **Parameter** | | | **Description** | | | | |
| 1 | | Length | | | 0x07/ (N-1) | | | | |
| 2 | | Key | | | 0x0B | | | | |
| 3 | | Index | | | Bit7: Default 1, Enable.  Bit6: Default 0: Alarm Clock 1: Medicine Clock(EV06 Only)  Range: 0-3 | | | | |
| 4 | | hour | | | Range: 0 to 23 Default: 0 | | | | |
| 5 | | min | | | Range: 0 to 59 Default: 0 | | | | |
| 6 | | Workday | | | Workday. Default 0 | | | | |
| 7 | | Time | | | Alarm clock reminder duration.  Default: 30. Range: 1-120. Unit: Second  Press SOS button to cancel | | | | |
| 8 | | Ring | | | Ringtone selection 1 to 3. Default: 1 | | | | |
| 9-N | | string | | | Describe in English. Maximum 32Bytes (EV06 Only) | | | | |
| WORKDAY (1 Byte) | | | | | | | | | |
| **Bit 7** | **6** | | **5** | **4** | | **3** | **2** | **1** | **0** |
| Reserved | SUN | | SAT | FRI | | THU | WED | TUS | MON |

### 3.2.0C No Disturb (0x0C)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x06 |
| 2 | Key | 0x0C |
| 3 | Flag | Bit7: 1, Enable. Default: 0 |
| 4 | Start hour | 0-23 Default: 0 |
| 5 | Start minute | 0-59 Default: 0 |
| 6 | End hour | 0-23 Default: 0 |
| 7 | End minute | 0-59 Default: 0 |

### 3.2.0D Password Protect(0x0D)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x05 |
| 2 | Key | 0x0D |
| 3-6 | Password | 4 bytes  Bit31: 1, Enable. Default: 0  Bit 30 to Bit 0: 000000-999999.  Default: 123456 |

### 3.2.0E Time Zone (0x0E)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x02 |
| 2 | Key | 0x0E |
| 3 | Time zone | 1 Byte. Signed char. Unit: 15minutes.  Range: -48 to +56 Default: 0 |

### 3.2.0F Enable Control (0x0F)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Byte No.** | | **Parameter** | **Description** | | |
| 1 | | Length | 0x05 | | |
| 2 | | Key | 0x0F | | |
| 3-6 | | Enable control | Default: 7F  Defined by the Table below | | |
| Table for Enable Control | | | | | |
| Bit No. | Description | | | Bit No. | Description |
| 0 | LED | | | 13 | Raise to wake（Watch only） |
| 1 | Voice Warnings | | | 14 | Home Beacon location |
| 2 | Vibration | | | 15 | Activity function |
| 3 | Cell Tower Locating | | | 16 | Step count function |
| 4 | Wi-Fi | | | 17 | Home wifi location |
| 5 | SOS Call Speaker ON/OFF | | | 18 | Data saver (EV04 only) |
| 6 | Side Call Speaker ON/OFF | | | 19 | Network location provider (EV04 only) |
| 7 | BLE Stay Connected(EV07B(X) EV04 Only) | | | 20 | Power control enble (CTM:EV07BX\_4072) |
| 8 | BLE Locating | | | 21 | Sos cannel switch(CTM:EV 07BX\_4072 EV06 0122)s |
| 9 | SOS Call Voice | | | 22 | Long SMS：(EV04/EV05/EV07B)   1. unsupported 2. support |
| 10 | BLE Always ON | | | 30 | Auto Update |
| 11 | GPS loc （GPS locate switch） | | | 31 | AGPS |
| 12 | Alert TCP Fast | | |  |  |

### 3.2.10 Ring-Tone Volume (0x10)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x02 |
| 2 | Key | 0x10 |
| 3 | Ring-Tone Volume | 0 to 100. Default: 100 |

### 3.2.11 Mic Volume (0x11)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x02 |
| 2 | Key | 0x11 |
| 3 | Mic Volume | 0-15. Default: 10 |

### 3.2.12 Speaker Volume (0x12)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x02 |
| 2 | Key | 0x12 |
| 3 | Speaker Volume | 0-100, 0 means mute. Default: 100 |

### 3.2.13 Device name (0x13)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | (N-1) |
| 2 | Key | 0x13 |
| 3-N | Device name | length < 20, Example: “EV201”. For BLE connection only |

### 3.2.14 Battery (0x14)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x04 |
| 2 | Key | 0x14 |
| 3 | Battery level | 0-100% |
| 4-5 | Voltage | mV |

### 3.2.15 Set BLE Location(0x15) for dock. (This is not for the device to store)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 1/(N-1) |
| 2 | Key | 0x15 |
| 3-6 | Latitude |  |
| 7-10 | Longitude |  |
| 11-N | string | Describe in English. Maximum 32Bytes |

### **3.2.16 Set whitelist device for docking station (0x16)**

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x02/(0x01+7\*N) |
| 2 | Key | 0x16 |
| 3 | Flag | Bit7: Enable. Bit [0-6]: index |
| 4-9 | BLE MAC |  |

### 3.2.17 Set SMS GPS URL(0x17)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | N-1 |
| 2 | Key | 0x17 |
| 3-N | GPS URL | Describe in English. Maximum 40Bytes |
| For example: *www.google.com/maps?q=%f,%f* | | |

### 3.2.18 Set SMS WI-FI/LBS URL(0x18)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | N-1 |
| 2 | Key | 0x18 |
| 3-N | URL | Describe in English. Maximum 40Bytes |
| For example: *smart-locator.com/web/geolocation/%s/%s* | | |

### 3.2.19 Voice Prompt ON/OFF(0x19)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Byte No.** | | **Parameter** | **Description** | | | |
| 1 | | Length | 0x05 | | | |
| 2 | | Key | 0x19 | | | |
| 3-6 | | Value | 0xFFFFFFFF | | | |
| Table for Enable Control | | | | | | |
| Bit No. | Description | | | Bit No. | Description |
| 0 | beep | | | 16 | Fine me |
| 1 | Tilt alarm | | | 17 | Call 6 |
| 2 | charging | | | 18 | Alarm ack |
| 3 | Battery low | | | 19 | Welfare check in |
| 4 | Call 1 | | | 20 | Welfare check out |
| 5 | Call 2 | | | 21 | Welfare check in warning |
| 6 | Call 3 | | | 22 | SOS not allow cancel |
| 7 | Call 4 | | |  |  |
| 9 | Fall down alarm | | |  |  |
| 8 | Call 5 | | |  |  |
| 10 | Sos alarm | | |  |  |
| 11 | Sos stop | | |  |  |
| 12 | Static alarm | | |  |  |
| 13 | Montion alarm | | |  |  |
| 14 | reserved | | |  |  |
| 15 | Activatry reminder | | |  |  |
| EV04 Special | | | | | | |
| 0 | Beep | | | 16 | Fine me |
| 1 | Tilt alarm canceled! | | | 17 | Call 6 |
| 2 | Your alarm is charging. | | | 18 | Alarm cancel |
| 3 | Battery low | | | 19 | Now time %s. |
| 4 | Call 1 | | | 20 |  |
| 5 | Call 2 | | | 21 | Call error |
| 6 | Call 3 | | | 22 | Call disconnected! |
| 7 | Call 4 | | | 23 | Call hang up! |
| 8 | Call 5 | | | 24 | Call 7 |
| 9 | Fall down alarm | | | 25 | Call 8 |
| 10 | SOS alarm | | | 26 | Call 9 |
| 11 | Click SOS to stop call sequence! | | | 27 | Call 10 |
| 12 | Static alarm | | | 28 | Alarm complete |
| 13 | Motion alarm | | | 29 | BLE connected |
| 14 | Tilt alert | | | 30 | DS location set |
| 15 | Activity reminder! | | | 31 |  |
| EV09 Special | | | | | | |
| 0 | beep | | | 16 | Fine me |
| 1 | Tilt alarm | | | 17 | Call 6 |
| 2 | charging | | | 18 | Alarm ack |
| 3 | Battery low | | |  |  |
| 4 | Call 1 | | |  |  |
| 5 | Call 2 | | |  |  |
| 6 | Call 3 | | |  |  |
| 7 | Call 4 | | |  |  |
| 8 | Call 5 | | |  |  |
| 9 | Fall down alarm | | |  |  |
| 10 | Sos alarm | | |  |  |
| 11 | Sos stop | | |  |  |
| 12 | Static alarm | | |  |  |
| 13 | Motion alarm | | |  |  |
| 14 | Tilt Cancel | | |  |  |
| 15 | Activity reminder | | |  |  |
| EC02 Special | | | | | | |
| 0 | beep | | | 16 | Fine me |
| 1 | Tilt alarm | | | 17 | Call 6 |
| 2 | charging | | | 18 | Alarm ack |
| 3 | Battery low | | |  |  |
| 4 | Call 1 | | |  |  |
| 5 | Call 2 | | |  |  |
| 6 | Call 3 | | |  |  |
| 7 | Call 4 | | |  |  |
| 8 | Call 5 | | |  |  |
| 9 | Fall down alarm | | |  |  |
| 10 | Sos alarm | | |  |  |
| 11 | Sos stop | | |  |  |
| 12 | Static alarm | | |  |  |
| 13 | Motion alarm | | |  |  |
| 14 | Sos press1 stop | | |  |  |
| 15 | Activity reminder | | |  |  |
| EV07BX Special | | | | | |
| 0 | beep | | | 16 | Fine me |
| 1 | Tilt alarm | | | 17 | Call 6 |
| 2 | charging | | | 18 | Alarm ack |
| 3 | Battery low | | | 19 | Welfare Chcekin |
| 4 | Call 1 | | | 20 | Welfare checkout |
| 5 | Call 2 | | | 21 | Welfare check warning |
| 6 | Call 3 | | | 22 | SOS not allow cancel [ev07bx\_4702] |
| 7 | Call 4 | | | 23 | Go Home |
| 8 | Call 5 | | | 24 | Leave Home |
| 9 | Fall down alarm | | | 25 | Alarm canceled (CTM: EV07BX 6111) |
| 10 | Sos alarm | | | 26 | Server disconnected  (EC01 Only) |
| 11 | Sos stop | | |  |  |
| 12 | Static alarm | | |  |  |
| 13 | Motion alarm | | |  |  |
| 14 | Stop call sequence | | |  |  |
| 15 | Activity reminder | | |  |  |
| EV12 Special | | | | | |
| 0 | beep | | | 16 | Fine me |
| 1 | Tilt alarm | | | 17 | Call 6 |
| 2 | charging | | | 18 | Alarm ack |
| 3 | Battery low | | | 19 | Welfare Chcekin |
| 4 | Call 1 | | | 20 | Welfare checkout |
| 5 | Call 2 | | | 21 | Welfare check warning |
| 6 | Call 3 | | | 22 | SOS not allow cancel [ev07bx\_4702] |
| 7 | Call 4 | | | 23 | Go Home |
| 8 | Call 5 | | | 24 | Leave Home |
| 9 | Fall down alarm | | | 25 | Alarm canceled |
| 10 | Sos alarm | | | 26 | Reserved |
| 11 | Sos stop | | | 27 | Call 7 |
| 12 | Static alarm | | | 28 | Call 8 |
| 13 | Motion alarm | | | 29 | Call 9 |
| 14 | Stop call sequence | | | 30 | Call 10 |
| 15 | Activity reminder | | | 31 | Call hangup |

### 3.2.1A Firmware (0x1A)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | N-1 |
| 2 | Key | 0x1A |
| 3-N | Internal Version | ascii |

### 3.2.1B GSM Module (0x1B) Read Only

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | N-1 |
| 2 | Key | 0x1B |
| 3-n | GSM Module |  |

### 3.2.1C Voice Prompt Volume (0x1C)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x02 |
| 2 | Key | 0x1C |
| 3 | Voice Prompt Volume | Range: 0-100. Default: 100 |

### 3.2.1D AGPS Reference Location (0x1D)(EV07B(X) Only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x0A |
| 2 | Key | 0x1D |
| 3 | Flag | Bit 7: Enable Update when GPS located |
| 4-7 | Latitude | Decimal Degrees. Signed number. (\*10,000,000)  4 bytes |
| 8-11 | Longitude | Decimal Degrees. Signed number. (\*10,000,000)  4 bytes |

### 3.2.1F System language setting (0x1F) (EV04 EV05 Only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | N-1 |
| 2 | Key | 0x1F |
| 3~N | Country code | String Country code |
| Reference <https://android.googlesource.com/platform/frameworks/base/+/android-8.1.0_r1/core/res/res/values/locale_config.xml> | | |

### 3.2.20 SOS button Setting (0x20)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x03 |
| 2 | Key | 0x20 |
| 3-4 | Value | Defined by the Value Table below |
| Value Table for SOS Button (2 bytes) | | |
| **Bit No.** | **Parameter** | **Description** |
| 0~1 | Feedback | 00: no feedback  01: vibrate  10: voice prompt  11: vibrate and voice prompt (Default) |
| 2~8 | Time | Range: 10-100. Default: 20. Unit: 0.1S |
| 9~12 | Task | 0000: no task  0001-1010: Dial 1st -10th Authorized Number  1111: SOS task (Default) |
| 13 | Trigger mode | 0: long press (Default)  1: double press |
| 14 | Reserve |  |
| 15 | Enable | 1: enable button |

### 3.2.21 Call 1 Button Setting (0x21)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x03 |
| 2 | Key | 0x21 |
| 3-4 | Value | Defined by the Value Table below |
| Value Table for Call 1 Button (2 bytes) | | |
| **Bit No.** | **Parameter** | **Description** |
| 0~1 | feedback | 00: no feedback  01: vibrate  10: voice prompt  11: vibrate and voice prompt (Default) |
| 2~8 | time | Range: 10-100. Default: 20. Unit: 0.1S |
| 9~12 | task | 0000: no task  0001-1010: Dial 1st -10th Authorized Number  0001: Dial 1st number (Default) |
| 13 | Trigger mode | 0: long press  1: double press |
| 14 | Reserve |  |
| 15 | Enable | 1: enable button |

### 3.2.22 Call 2 Button Setting (0x22)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x03 |
| 2 | Key | 0x22 |
| 3-4 | value | Defined by the Value Table below |
| Value Table for Call 2 Button (2 bytes) | | |
| **Bit No.** | **Parameter** | **Description** |
| 0~1 | feedback | 00: no feedback  01: vibrate  10: voice prompt  11: vibrate and voice prompt (Default) |
| 2~8 | time | Range: 10-100. Default: 20. Unit: 0.1S |
| 9~12 | task | 0000: no task  0001-1010: Dial 1st -10th Authorized Number  0001: Dial 1st number (Default) |
| 13 | Trigger mode | 0: long press  1: double press |
| 14 | Reserve |  |
| 15 | Enable | 1: enable button |

### 3.2.30 Set Authorized Number (0x30)

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** | |
| 1 | Length | N-1 | |
| 2 | Key | 0x30 | |
| 3 | flag | Defined by Flag table below. Default: 0 | |
| 4-N | Number | The phone number is less than 20 bytes. | |
| Flag Table for Authorized Numbers | | | |
| Bit 0~3 | Value Range: 0-9.  The serial number of the contacts.  0000/0001/0010/0011/0100/0101/0111/1000/1001 | Bit 5 | Accept Phone Call |
| Bit 6 | Accept SMS |
| Bit 4 | No SIM Dialing | Bit 7 | Enable |

### 3.2.31 SMS Reply Prefix Text (0x31)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | N-1 |
| 2 | Key | 0x31 |
| 3 | Flag | Bit7: enable |
| 4-N | Text | length <24. Default: null |

### 3.2.32 SOS Option (0x32)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x05 |
| 2 | Key | 0x32 |
| 3-4 | Hold-Time | Unit: second. Allowed talk time 0-65535s. Default: 600 |
| 5 | Rings time | Unit: second. Allowed ring time,1-60s. Default: 20 |
| 6 | Cycle | Unit: Times. Cycling times, 0-10. 0 means infinite loop until connected. Default: 1 |

### 3.2.33 Phone Switches (0x33)

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** | |
| 1 | Length | 0x05 | |
| 2 | Key | 0x33 | |
| 3-6 | Flag | Defined by Flag table below | |
| Flag Table for Phone Switches | | | |
| **Byte No.** | **Parameter** | | **Description** |
| 0~6 | Auto answer after rings | | 0-10. Default: 3 |
| 7 | Auto answer enable | | Default: 1 |
| 8 | Enable Call In White List (Only authorized number call in) | | Default: 0 |
| 9 | Enable Button hang-up | | Default: 1 |
| 10 | Reserved | | Default: 0 |
| 11 | Enable SMS White List (Only accept SMS from Authorized number) | | Default: 0 |
| 12~13 | Reserved | | Default: 0 |
| 14 | A1 phone monitor(value 1:enable,0:disable) | | Default:1 |
| 15 | SOS Phone ring switch (CTM:EV07BG\_3107) | | Default 0 |
| 16 | Call incoming, Ring Tone switch | | Default:1 |
| 17 | Call incoming, vibrate switch | | Default:1 |
| 18~27 | reserve | | 0x05 |
| 28~31 | Ring Tone ID(CTM:EV05 Only) | | 0-6. Default:0 |
| 电话接听的逻辑关系：  1.是否有白名单，有，如果不在白名单下就挂断  2.是否使能环境监听功能，是，直接接听  3.是否自动接听功能，处理接听。  4.否则按键接听 | | | |

### 3.2.34 Set Authorized Numbers with Name and Photos (0x34)(EV05 Only)

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** | |
| 1 | Length | m+1~ | |
| 2 | Key | 0x34 | |
| 3 | flag | See to flag define.0 | |
| 4 | Number length |  | |
| 5-n | Number | The phone number is less than 20byte. | |
| n+1 | Name length |  | |
| n+2-m | Name | UTF-8 String less than 36byte | |
| m+1 | Photo URL length |  | |
| m+2- | Photo URL  **[Photo Server Required]** | EV06 Only Special:  T0-Head Icon 1  T1-Head Icon 2  T2-Head Icon 3  T3-Head Icon 4 | |
| Flag Table for Authorized Numbers | | | |
| Bit 0~3 | Value Range: 0-9.  The serial number of the contacts.  0000/0001/0010/0011/0100/0101/0111/1000/1001 | Bit 5 | Accept Phone Call |
| Bit 6 | Accept SMS |
| Bit 4 | No SIM Dialing | Bit 7 | Enable |

Contact photo description:

To get the photo from the server, the URL should start with http. The device downloads the file via http, the picture format should be png or jpg. The name of the picture file is generated according to the serial number of the contact, and the naming rules are as h0.jpg～h9.jpg. The save path is head/h0.jpg

To set a photo through parameter editor tool, the tool executes the command "evd push head\h0.jpg /sdcard/head" to store the photo ID to the device.

使用HTTP URL设置大头贴，客户需要搭建HTTP服务器。HTTP服务器头像下载接口要求如下：

|  |  |
| --- | --- |
| **HTTP请求头（POST）** | |
| Key | Value |
| **User-Agent** | **ev-android/8.1** |
| **model** | **型号，例如：EV05** |
| **devId** | **设备IMEI，例如：896451654312653** |

|  |  |
| --- | --- |
| **HTTP返回头** | |
| **file\_md5** | **头像文件MD5,例如：** |
| **Content-length** | **Body内容图片文件大小** |

### 3.2.35 Set Personal Data Information (0x35)(EV05/EV06 only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | K-1 |
| 2 | Key | 0x35 |
| 3 | Name Length |  |
| 4 | URL Length |  |
| 5 | Head URL Length |  |
| 6 | Height | Units (CM) |
| 7 | Weight | Units (KG) |
| 8 | Blood type + male | Bit0~3 0-O type  1-B type  2-A type  3-AB type  15-Empty (Default)  Bit4  0-Rh negative  1-Rh Positive  Bit6~7  0-male  1-female  2-Empty (Default) |
| 9~12 | Birthday | UTC time |
| 13～n | Name | N<32 |
| n+1~m | URL | <64 |
| m+1~k | Head URL | <64  EV06 Only Special:  T0-Head Icon 1  T1-Head Icon 2  T2-Head Icon 3  T3-Head Icon 4 |

### 3.2.36 Watch Settings (0x36)(EV05 EV06 only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x0E/0x11/Extendable |
| 2 | Key | 0x36 |
| 3 | Watch face id | 0~n-1 |
| 4~7 | Watch enable status | Bit0-screen always On(removed)  Bit1-time report  Bit2-No use  Bit3-Step count/ Heart value display  Bit8-Raise hand detect  Bit9-Tap screen turn on screen  Bit10- Touch to trigger SOS  Bit11- Step count display  Bit12- Heart value display  Bit13-Wear Detect enable  Bit14-Take medicine enable (EV06 Only)  Bit15-Use 12-Hour format (AM/PM)  Bit16-Drink Alarm Clock enable (CTM:EV06 4001)  Bit17-Sport Alarm Clock enable (CTM:EV06 4001) |
| 8~11 | Watch menu item enable | Table for Watch menu item enable |
| 12~15 | The during auto return home | Units (s) |
| 16 | Brightness (EV06 Only) | 0~10(level), Default:3 |
| 17 | Bright\_time (EV06 Only) | Default:10s  value option:  10s, 15s, 30s, 60s, 120s |
| 18 | Logo index(EV06 Only) | Logo Index 0~2 default: 1 |
| Table for Watch menu item enable | | |
| EV05 Special | | |
| Bit No. | Description | |
| Bit0 | no use | |
| Bit1 | Heart rate | |
| Bit2 | Steps | |
| Bit3 | Contact | |
| Bit4 | Weather | |
| Bit5 | Settings | |
| Bit6 | Turn Watch Off (CTM: EV05 0125)(CTM:EV10 0123) | |
| EV06 Special | | |
| Bit No. | Description | |
| Bit0 | no use | |
| Bit1 | Heart rate | |
| Bit2 | Steps | |
| Bit3 | Contact | |
| Bit4 | Reserved | |
| Bit5 | Settings | |
| Bit6 | Blood oxygen | |
| Bit7 | Alarm clock | |
| Bit8 | remind | |

### 3.2.40 APN (0x40)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | N-1 |
| 2 | Key | 0x40 |
| 3-N | APN | length<32. Default: null |

### 3.2.41 APN Username (0x41)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | N-1 |
| 2 | Key | 0x41 |
| 3-N | APN Username | length<16. Default: null |

### 3.2.42 APN Password (0x42)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | N-1 |
| 2 | Key | 0x42 |
| 3-N | APN Password | length<16. Default: null |

### 3.2.43 Sever IP &Port (0x43)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | N-1 |
| 2 | Key | 0x43 |
| 3 | Flag | Bit7  1: GPRS enable  Bit0  0: TCP (Default)  1: UDP |
| 4-5 | Port | 0-65535. Default: 5050 |
| 6-N | IP Address or Domain Name | length<50 bytes.  Default: www.smart-locator.com |

### 3.2.44 Time Interval (0x44)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x0D |
| 2 | Key | 0x44 |
| 3-6 | Heartbeat Interval | Bit31  1 enable (Default)  Unit: second, Default: 200.  Range: 60s to 86400s. |
| 7-10 | Auto Upload Interval | Unit: second. Default: 180, >10s |
| 11-14 | Auto Upload Lazy Interval | Unit: second. Default:600, >300s |
| Byte 7~10 and 11~14 are related to the working mode functionality of Part:3.2.0A Working Mode (0x0A). This byte is applied in the case of mode 1.2.3.6. | | |

### 3.2.45 Continue Locate Time Parameter (0x45)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x05 |
| 2 | Key | 0x45 |
| 3-4 | Interval | Default: 10s. Range: 10-600 |
| 5-6 | Time | Unit: second. Default: 600. Range: 60-1800s |

### 3.2.46 Heart Rate Interval(0X46) EV06 EV05 EC02 Only

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x05 |
| 2 | Key | 0x46 |
| 3-6 | Heart Rate Detecting Interval | Bit31  1: Enable (Default); 0: Disable  Unit: second. Default: 600. Range: 60-86400 |

### 3.2.47 Customized Device ID (0X47) Optional

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | N-1 |
| 2 | Key | 0x47 |
| 3-N | Device ID | Customized Device ID follows the IMEI in every message. Default: null |

### 3.2.48 Static AES128 Set (0X48) Write only

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x25 |
| 2 | Key | 0x48 |
| 3-6 | KEY\_ID | Please refer to the 4.2 Encryption |
| 7-22 | AES Key |  |
| 23-38 | AES IV |  |

### 3.2.49 Read Static AES128 CRC (0X49) Read Only

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x09 |
| 2 | Key | 0x49 |
| 3-6 | KEY\_ID |  |
| 7-10 | CRC | This will be 0 (Default) if Static AES disabled.  Or should be the value of CRC32 Algorithm from AES Key & AES IV |

### 3.2.4A WIFI connect network (0X4A) (EV04 EV05 Only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 5+n+m |
| 2 | Key | 0x4A |
| 3 | Status | Bit7: Enable status  Bit6: Now connected flag  Bit0~Bit5: index from 0 start |
| 4 | SSID length | N |
| 5 | Password length | M |
| 6-(6+n) | SSID content |  |
| (6+n)-(6+n+m) | Password content |  |

### 3.2.4B Cat-M Setting (0X4B) (NB eMTC Only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x1F |
| 2 | Key | 0x4B |
| 3 | IOT Mode | 0 eMTC  1 NB-IoT  2 eMTC & NB-IoT |
| 4 | eMTC eDRX Requst paging time window | 0:1.28s 1:2.56s 2:3.84s 3:5.12s  4:6.4s 5:7.68s 6:8.96s 7:10.24s  8:11.52s 9:12.8s 10:14.08s 11:15.36s  12:16.64s 13:17.92s 14:19.2s 15:20.48s  FF: OFF eDRX |
| 5 | eMTC eDRX Value | 0:5.12s 1:10.24s 2:20.48s 3:40.96s  4:61.44s 5:81.92s 6:102.4s 7:122.88s  8:143.36s 9:163.84s 10:327.68s 11:655.36s  12:1310.72s 13:2621.44s 14:5242.88s 15:10485.76s  FF: OFF eDRX |
| 6 | NB-IoT eDRX Requst paging time window | 0: 2.56s 1:5.12s 2:7.68s 3:10.24s  4:12.8s 5:15.36s 6:17.92s 7:20.48s  8:23.04s 9:25.6s 10:28.16s 11:30.72s  12:33.28s 13:35.84s 14:38.4 s 15:40.96s  FF: OFF eDRX |
| 7 | NB-IoT eDRX Value | 0:5.12s 1:10.24s 2:20.48s 3:40.96s  4:61.44s 5:81.92s 6:102.4s 7:122.88s  8:143.36s 9:163.84s 10:327.68s 11:655.36s  12:1310.72s 13:2621.44s 14:5242.88s 15:10485.76s  FF: OFF eDRX |
| 8 | GSM | 0: No change  01:GSM 900  02:GSM 1800  04:GSM 850  08:GSM 1900  0F: all Freq |
| 9-20 | EMTC | A hexadecimal value that specifies the eMTC frequency band. If it is set to 0or 0x40000000, it means not to change the frequency band. (eg.: 0x15=0x01(LTEB1)+0x04(LTE B3)+0x10(LTE B5)) 0x1 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND1) LTE B1 0x2 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND2) LTE B2 0x4 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND3) LTE B3 0x8 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND4) LTE B4 ~~0x10 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND5)  LTE B5~~ 0x80 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND8)  LTE B8 0x800 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND12) LTE B12 ~~0x1000 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND13) LTE B13 0x2000 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND14) LTE B14 0x20000 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND18)  LTE B18 0x40000 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND19) LTE B19~~ 0x80000 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND20) LTE B20 ~~0x1000000 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND25) LTE B25 0x2000000 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND26) LTE B26 0x4000000 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND27) LTE B27~~ 0x8000000 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND28) LTE B28 ~~0x40000000 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND31) LTE B31 0x20000000000000000 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND66)LTE B66 0x800000000000000000 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND72)LTE B72 0x1000000000000000000 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND73)LTE B73 0x1000000000000000000000  (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND85)LTE B85~~ |
| 21-32 | NBIOT | A hexadecimal value that specifies the NB-IoT frequency band. If it is set to 0 or 0x40000000, it means not to change the frequency band. 0x1 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND1) LTE B1 0x2 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND2) LTE B2 0x4 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND3) LTE B3 0x8 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND4) LTE B4 ~~0x10 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND5) LTE B5~~ 0x80 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND8) LTE B8 0x800 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND12) LTE B12 ~~0x1000 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND13) LTE B13 0x20000 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND18) LTE B18 0x40000 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND19) LTE B19~~ 0x80000 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND20) LTE B20 ~~0x1000000 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND25) LTE B25 0x2000000 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND26) LTE B26~~ 0x8000000 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND28) LTE B28 ~~0x40000000 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND31) LTE B31 0x20000000000000000 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND66)LTE B66 0x400000000000000000 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND71)LTE B71 0x800000000000000000 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND72)LTE B72 0x1000000000000000000 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND73)LTE B73 0x1000000000000000000000 (CM\_BAND\_PREF\_LTE\_EUTRAN\_BAND85)LTE B85~~ |
| 增加Cat-M 参数。  更新的NBIOT与CAT锁频的协议 | | |

### 3.2.4C APN Settings (0X4C) (EV04 EV05 EV07B Only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 9+J+K+L |
| 2 | Key | 0x4C |
| 3-4 | Index |  |
| 5-7 | PLMN | MCC+MNC  460+01=46001  310+090=310090 |
| 8 | APN length | 1 |
| 9 | User Name length | 1 |
| 10 | Password length | 1 |
| 11-(11+J) | APN content | J |
| (11+J) - (11+J+K) | User Name content | K |
| (11+J+K)- (11+J+K+L) | Password content | L |
|  |  |  |

### 3.2.4D APN Settings query status(0X4D) (EV04 EV05 Only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 7+J+K+L |
| 2 | Key | 0x4D |
| 3-5 | PLMN | MCC+MNC  460+01=46001  310+090=310090 |
| 6 | APN length | 1 |
| 7 | User Name length | 1 |
| 8 | Password length | 1 |
| 8-(8+J) | APN content | J |
| (8+J) - (8+J+K) | User Name content | K |
| (8+J+K)- (8+J+K+L) | Password content | L |

### 3.2.4E GSM Feature band (0x4E)（PET Only）

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x02 |
| 2 | Key | 0x4E |
| 3 | Value | 0x00-ALL  0x01-US  0x02-EUROPE  0x03-KOREA  0x04-AUSTRALIA  0x05-MID\_EAST  0x06-JAPAN  0x07-CHINA  0x08-INDIA  0x09-MEXICO |

### 3.2.4F Set Preferred network type(0x4F)（EV05/EV04 Only）

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x02 |
| 2 | Key | 0x4F |
| 3 | Value | 0x00-GSM/WCDMA/LTE(Default)  0x01-GSM/WCDMA  0x02-GSM Only  0x03-WCDMA Only  0x04-LTE Only  0x05-WCDMA/LTE |

### 3.2.50 Power Alert (0x50)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x05 |
| 2 | Key | 0x50 |
| 3-6 | Flag | Defined by Flag table below |

|  |  |  |  |
| --- | --- | --- | --- |
| Flag Table For Power Alert | | | |
| Bit 0~7 | Low Power Alert Threshold. Default: 15  Range: 10-50 | Bit 27 | Power OFF SMS 1=Enable,0=Disable(default) |
| Bit 8~15 | Low Power Voice Prompt Threshold. Default: 20  Range: 10-50 | Bit 28 | Low Power Voice Prompt |
| Bit 16~23 | User Low Power Alert Threshold. Default: 5  Range:1-10 (CTM: ev07bx\_0106) | Bit 29 | Low Power Alert |
| Bit 24 | User Low Power Alert  (CTM: ev07bx\_0106) | Bit 30 | Alert Power ON |
| Bit 25 | Power OFF Loc first  1=Enable,0=Disable(default) | Bit 31 | Alert Power OFF |
| Bit 26 | Power ON SMS  1=Enable,0=Disable(default) |  |  |

### 3.2.51 GEO Alert (0x51)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Byte No.** | **Parameter** | | | **Description** | |
| 1 | Length | | | 2+N\*8 | |
| 2 | Key | | | 0x51 | |
| 3-6 | Flag | | | Defined by Flag table below | |
| 7-10 | Latitude 1 | | |  | |
| 11-14 | Longitude 1 | | |  | |
| …. | … | | |  | |
|  | Latitude n | | |  | |
|  | Longitude n | | |  | |
| Flag for GEO Alert (32 bits) | | | | | |
| Bit 0~3 | | Index | Bit 10 | | Type  0: Circle (Default)  1: Polygon |
| Bit 4~7 | | Points | Bit 11~15 | | Reserved |
| Bit 8 | | Enable. Default: 0 | Bit 16~31 | | Radius |
| Bit 9 | | Direction  0: Out (Default)  1: In |  | |  |

### 3.2.52 Motion Alert (0x52)

|  |  |  |
| --- | --- | --- |
| Byte No. | Parameter | Description |
| 1 | Length | 0x05 |
| 2 | Key | 0x52 |
| 3-6 | Value | Defined by the below Value table |

|  |  |  |
| --- | --- | --- |
| Value Table (32bits) | | |
| Bit 0~15 | Cooldown Period | 120(Default)  Unit: Second  Range: 60~36000 |
| Bit 16~29 | Continued moving period to activate the alert. | 3 (Default)  Unit: Second  Range: 1~60 |
| Bit 30 | Dial | 0 (Default) |
| Bit 31 | Enable | 0 (Default) |

### 3.2.53 No-Motion Alert (0x53)

|  |  |  |
| --- | --- | --- |
| Byte No. | Parameter | Description |
| 1 | Length | 0x05 |
| 2 | Key | 0x53 |
| 3-6 | Value | Defined by the below Value table |

|  |  |  |
| --- | --- | --- |
| Value Table (32bits) | | |
| Bit 0~29 | Continued static period to activate the alert. | 300 (Default)  Unit: Second  Range: 60-36000 |
| Bit 30 | 1: Dial; 0: No action | 0 (Default) |
| Bit 31 | 1: Enable; 0: Disable | 0 (Default) |

### 3.2.54 Over speed Alert (0x54)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x03 |
| 2 | Key | 0x54 |
| 3-4 | Over speed Threshold | Bit 15:  1 Enable. Default: 0.  Bit 14-0:  Range: 20-400. Default: 80  Unit: KM/H |

### 3.2.55 Tilt Alert (0x55)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x05 |
| 2 | Key | 0x55 |
| 3-6 | Value | Default: 0. Defined by the Value Table below |

|  |  |  |
| --- | --- | --- |
| Value Table (32 bits) | | |
| Bit 0~15 | Time Threshold | Unit: Second  Default: 30  Range: 10-180 |
| Bit 16~23 | Angle Threshold | Unit: Degree  Default: 45  Range: 30-90 |
| Bit 24~29 | Reserved |  |
| Bit 30 | 1: Dial; 0: No action | 0 (Default) |
| Bit 31 | 1: Enable; 0: Disable | 0 (Default) |
| Note: Both Angle and Time to be exceeded to activate an alert. | | |

### 3.2.56 Fall down Alert (0x56)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x02 |
| 2 | Key | 0x56 |
| 3 | Flag | 1 Byte. Defined by the Flag Table below |

|  |  |  |
| --- | --- | --- |
| Value Table (8bits) | | |
| Bit 0~3 | Sensitive Level | Default: 5. Range: 1-9 |
| Bit 4 | Reserved |  |
| Bit 5 | 1: Always on; 0: off (EC03 only) | 0 (Default) |
| Bit 6 | 1: Dial; 0: No Dial | 0 (Default) |
| Bit 7 | 1: Enable; 0: Disable | 0 (Default) |

### 3.2.57 Welfare Check (0x57)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x05/0x09 |
| 2 | Key | 0x57 |
| 3-6 | Value | Default: 0. Defined by the Value Table below |
| 7~10 | Value(New Add) | Default:300. Warning time, Unit: second |

|  |  |  |
| --- | --- | --- |
| Value Table (32 bits) | | |
| Bit 0~30 | Range:600~360000 | 3600 (Default) |
| Bit 31 | 1: Enable; 0: Disable | 0 (Default) |
| Warning time Table (32 bits) | | |
| Bit 0~30 | Range:120~6000 | 300(Default) |
| Bit 31 | 1: Dial; 0: No dial | 0 (Default) |

### 3.2.58 Alert Notification HTTP API (0x58) (EV04 only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | N-1 |
| 2 | Key | 0x58 |
| 3 | Flag | Bit7: Enable bit |
| 4~7 | Customer ID | 4Bytes integer |
| 8~11 | Centre ID | 4Btyes integer |
| 12~N | URL | URL to notify |

### 3.2.59 Motion Detect Settings (0x59)(EV04 Only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x02/Extendable |
| 2 | Key | 0x59 |
| 3 | Motion level | Default 7, Range: 1~16  1-high level  16- low level |

### 3.2.5A GEO Alert Detect Settings (0x5A)(EV04/EV05 Only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x05 |
| 2 | Key | 0x5A |
| 3~6 | GEO Time Interval | Bit31  0 disable (Default)  1 enable active GPS interval  Unit: second, Default: 180.  Range: 60s to 86400s. |

### 3.2.5B Step Collect Settings (0x5B)(EV05 Only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x05 |
| 2 | Key | 0x5B |
| 3~6 | Time Interval | Bit31  0 disable (Default)  1 enable Step collect interval  Unit: second, Default: 3600.  Range: 60s to 86400s. |

### 3.2.5C Dog Barking Settings (0x5C)(EC208 Only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x06/Extendable |
| 2 | Key | 0x5C |
| 3 | Barking level | Bit7:  Bark detection enable  0 disable  1 enable  Bit0~Bit6:  Default 5, Range: 1~9  1-low level  9- high level |
| 4-7 | Barking time upload | Default:1min  Range 10 s-1h |

### 3.2.5D Alert Level Settings (0x5D)(EV07B CTM:4601)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x02/Extendable |
| 2 | Key | 0x5D |
| 3 | No-Motion Alarm level | Default 7, Range: 1~16  1-high level  16- low level |

### 3.2.5E Side Button Alert (0x5E)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x02/ Extendable |
| 2 | Key | 0x5E |
| 3 | Flag | 1 Byte. Defined by the Flag Table below |

|  |  |  |
| --- | --- | --- |
| Value Table (8bits) | | |
| Bit 0~4 | Reserved |  |
| Bit 5 | 1: SMS on; 0: SMS off | 0 (Default) |
| Bit 6 | 1: Dial; 0: No Dial | 0 (Default) |
| Bit 7 | 1: Enable; 0: Disable | 0 (Default) |

### 3.2.5F Home Detect Settings (0x5F) (EV04/EV05 Only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x05/Extendable |
| 2 | Key | 0x5F |
| 3~6 | Home Check Time Interval | Bit31  0 disable (Default)  1 enable active WIFI/BLE Scan interval  Unit: second, Default: 180.  Range: 120s to 86400s. |

### 3.2.60 Device Power Information (0x60)(Internal Use)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x0A/Extendable |
| 2 | Key | 0x60 |
| 3 | Calibration Flag | BT - 0x01  FT - 0x10 |
| 4 | Charging Status | 0x00 - Not Charging  0x01 - Fully Charged  0x02 - Charging |
| 5 | Battery Level | Percentage. Range: 0-100 |
| 6-7 | Battery Voltage | Unit: mV |
| 8-9 | Charge Current | Unit: mA |
| 10-11 | Charge Voltage | Unit: mV |

### 3.2.61 SIM card MSISDN (0x61) Read Only

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | N-1 |
| 2 | Key | 0x61 |
| 3-N | Number | The phone number should be less than 20 bytes. |
| This is the phone number that includes a country code and a National Destination Code which identifies the subscriber's operator. | | |

### 3.2.62 WIFI whitelist (0x62)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | N-1 |
| 2 | Key | 0x62 |
| 3 | Flag | Bit7: Enable. Bit [0-6]: index (0~49) |
| 4-9 | WIFI MAC | Wi-Fi hotspot mac address |
| 10-13 | Latitude |  |
| 14-17 | Longitude |  |
| 17-N | Wi-Fi description | String (max length=16bytes) end by '\0' |

### 3.2.63 Power save (0x63) EC02/EV06 Only

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x06 |
| 2 | Key | 0x63 |
| 3 | Flag | Bit7: 1, Enable. Default: 0 |
| 4 | Start hour | 0-23 Default: 0 |
| 5 | Start minute | 0-59 Default: 0 |
| 6 | End hour | 0-23 Default: 0 |
| 7 | End minute | 0-59 Default: 0 |

### 3.2.64 Mobile network information (0x64)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | N-1 |
| 2 | Key | 0x64 |
| 3 | Strength | Now strength |
| 4～7 | Band | Absolute RF Channel Number |
| 8～N | Operator name |  |

### 3.2.65 Device network status (0x65) (For App assist connect server)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x10 |
| 2 | Key | 0x65 |
| 3 | Strength | Now strength |
| 4 | Status | Mobile network status:  0Searching network  1 No service  2 Limited service, emergency call only  3 Full service |
| 5 | Server status | Connect Server status:  0 disconnect status  1 connected status |
| 6～11 | PLMN | Network PLMN |
| 12～17 | PLMN | Home PLMN |

### 3.2.66 IMSI information (0x66) Read Only

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | N-1 |
| 2 | Key | 0x66 |
| 3-N | Number | The phone number should be less than 15 bytes. |
| International Mobile Subscriber Identification Number | | |

### 3.2.67 Home WIFI match number (0x67)(CTM:EV05 0104 EV07BX 0107)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x03 |
| 2 | Key | 0x67 |
| 3 | Number | Number of matched |
| 4 | Number | Number of not matched |
|  | | |

### 3.2.68 Operator Information (0x68) (Read Only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x05/ Extendable |
| 2 | Key | 0x68 |
| 3-4 | MCC |  |
| 5-6 | MNC | 2Bytes |

### 3.2.69 System Calling settings (0x69) (CTM: EV04 3304)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x02/Extendable |
| 2 | Key | 0x69 |
| 3 | CLIR Settings | CLIR Settings Value:  0-Network (Default)  1-Hide Number  2-Show Number |

### 3.2.6A Weather update settings(0x6A) (CTM:EV05 0102)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x09/Extendable |
| 2 | Key | 0x6A |
| 3-6 | Auto update time interval | Bit31:   1. Enable 2. Disable   Bit0~Bit30:  Default: 21600. Unit: Second  Range: 900s ~ 259200s |
| 7-10 | Manual update Time threshold | Default: 1200. Unit: Second  Range: 0s ~ 86400s |

### 3.2.70 BLE Scan time(0x70)(EV07B(X) Only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x05 |
| 2 | Key | 0x70 |
| 3-4 | Scan Time | Default: 5. Unit: Second |
| 5-6 | Sleep Time | Default: 55. Unit: Second |

### 3.2.71 BLE Scan beacon (0x71) (EV07B(X) Only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x03 |
| 2 | Key | 0x71 |
| 3-4 | Scan Mode Time | Default: 5. Unit: Second |

### 3.2.72 BLE iBeacon UUID(0x72) (EV07B(X) Only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x14 |
| 2 | Key | 0x72 |
| 3 | Flag | 0x80. Default: Enable |
| 4-5 | Company id | Apple 0x004c |
| 6-21 | UUID |  |

### 3.2.73 Set beacon location list (0x73)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | N-1 |
| 2 | Key | 0x73 |
| 3 | Flag | Bit7 : enable bit[0-6]: index |
| 4-9 | Beacon MAC | 6bytes |
| 10-13 | latitude | Int32 |
| 14-17 | longitude | Int32 |
| 18-N | Beacon description | String (max length=16bytes) end by '\0' |

### 3.2.74 Find Me configure (0x74)(CTM: EV07BX 0107)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Byte No.** | | **Parameter** | **Description** | | |
| 1 | | Length | 0x05 | | |
| 2 | | Key | 0x74 | | |
| 3-6 | | value | Default:0  Defined by the Table below | | |
| Table for Enable Control | | | | | |
| Bit No. | Description | | | Bit No. | Description |
| 0 ~ 7 | times the music is played (0 - 255) | | | 24 | 1-Click SOS can cancel  0-Click SOS can’t cancel (Default) |
| 8 ~ 15 | Music playback index (0 - 255) | | | 25~31 | Reserve |
| 16~23 | Music gain(0 – 100,step:10) | | |  |  |

### 3.2.75 Extra Enable Control (0x75)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Byte No.** | | **Parameter** | **Description** | | |
| 1 | | Length | 0x05（The length can be expanded, and the device does not need to be fixed） | | |
| 2 | | Key | 0x75 | | |
| 3-6 | | Enable control | Default:0  Defined by the Table below | | |
| Table for Enable Control | | | | | |
| Bit No. | Description | | | Bit No. | Description |
| 0 | WIFI loc name enable**(CTM:EV07BX Only)** | | | 16 | Control Handshake Password Enable  0 disable (default)  1 enable  **(CTM: EV06 0122)**  **Reference:<3.9.0E BLE/USB Extend Password Handshake>** |
| 1 | Home alert Switch ,value is  0 disable (default)  1 enable | | | 17 | BLE Long Range Enable  (EV07BX Only)  0 disable(default)  1 enable |
| 2 | Beacon V2  0 disable  1 enable | | | 18 | Motion Alert Data Only(CTM:EV05 42001)  0 disable  1 enable |
| 3 | BLE Scan switch  0 disable  1 enable | | | 19 | Leave home alert  Switch,value is  0 disable  1 enable |
| 4 | ~~Bark detection enable(Pet Only)~~  ~~0 disable~~  ~~1 enable~~ | | | 20 | Leave home alert sms  Switch value is  0 disable  1 enable |
| 5 | No Motion Alert Data Only(CTM:EV05 42001)  0 disable  1 enable | | | 21 | Back home alert  Switch,value is  0 disable  1 enable |
| 6 | Whether to enter power saving at home(**EV06 Only**)  0 disable (default)  1 enable | | | 22 | Back home alert sms  Switch value is  0 disable  1 enable |
| 7 | Stop Alert call sequence, when call accepted. | | | 23 | History data upload (CTM:EV07BX 4702)  0-History data upload  1-Disable history data upload |
| 8 | BLE iBeacon Enable | | | 24 | 短信CS/PS选择：(CTM:EV07BX 6111)  0-PS  1-CS |
| 9 | BLE Eddystone Enable | | | 25 | Auto flight mode enable  (CTM: EV06 0122)  1 ON (Default)  0 OFF |
| 10 | Disable VoLTE   1. Disable 2. Enable | | | 26 | Enable connect to Jumper device  (EV04 DS3 Only)  0-Disable (Default)  1-Enable |
| 11 | DTMF Tone generation Calling(CTM:EV 07BX\_3104) | | |  |  |
| 12 | Disable Manual Cancel Alert (CTM:EV05 4001)   1. Disable 2. Enable | | |  |  |
| 13 | Alert SMS fast   1. Enable 2. Disable | | |  |  |
| 14 | 1. Upload all type history data 2. ONLY Upload history STEP/SPO2/Heartrate   (CTM:EV06 0122) | | |  |  |
| 15 | SMS URL WIFI/Cell Geolocation Enable:  1.Enable  0.Disable | | |  |  |

### 3.2.76 Extra Voice Prompt ON/OFF(0x76)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Byte No.** | | **Parameter** | **Description** | | | |
| 1 | | Length | 0x05/Extendable | | | |
| 2 | | Key | 0x76 | | | |
| 3-6 | | Value | 0xFFFFFFFF | | | |
| Table for Enable Control | | | | | | |
| EV04 Special (Value) | | | | | | |
| 0 | Welfare check in | | |  |  |
| 1 | Welfare check out | | |  |  |
| 2 | Welfare check warning | | |  |  |
| 3 | Leave home | | |  |  |
| 4 | Go home | | |  |  |
| 5 | Sub1G start scan (EV04S Only) | | |  |  |
| 6 | Sub1G scan success (EV04S Only) | | |  |  |
| 7 | Sub1G scan timeout (EV04S Only) | | |  |  |
| 8 | Sub1G whitelist full (EV04S Only) | | |  |  |

### 3.2.77 Run Step Alert Settings(0x77)（CTM:EV07BX 0107）

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x05 |
| 2 | Key | 0x77 |
| 3-6 | Value | Bit0~7: Time threshold Unit (s) Range:30-120s  Bit8~15: Step count value threshold Range: 20-255  Bit16: Alert Enable/Disable  Bit17: Alert Call (1-Eanble; 0-Disable)  Bit18~31: Reserve |

|  |
| --- |
|  |

### 3.2.78 Device State Settings (0x78) (CTM: EV06 0122)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x02/Extendable |
| 2 | Key | 0x78 |
| 3 | State | 1. Normal state (Default) 2. Shipping state (Set shipping state->Power off->Power on ->Clear history data-> Reset to normal state)   其它取值保留 |

### 3.2.79 Fall down Alert Extra Param (0x79) (CTM: EV07BX 0107, EV05 0104)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x03/ Extendable |
| 2 | Key | 0x79 |
| 3-4 | Wait time | 检测到跌倒后，在<Wait time>规定的时间内，步数小于对应阀值触发报警，大于对应阀值不触发报警。  取值范围：10~600s  单位：秒 |

### 3.2.7A SPO2 Detect Interval(0X7A) EV06 Only

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x05 |
| 2 | Key | 0x7A |
| 3-6 | SPO2 Detecting Interval | Bit31  1: Enable (Default); 0: Disable  Unit: second. Default: 600. Range: 60-86400 |

### 3.2.7B Extra Alarm Clock (0x7B) (CTM: EV06 4001)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Byte No.** | | **Parameter** | | | **Description** | | | | |
| 1 | | Length | | | 0x09/N-1 | | | | |
| 2 | | Key | | | 0x7B | | | | |
| 3 | | Flag | | | Bit7: Default 0,  1-Enable.  0-Disable. | | | | |
| 4 | | Alarm type | | | 0-Alarm clock (Default)  1-Medicine clock  2-Drink clock  3-Sport clock | | | | |
| 5 | | Index | | | Range: 0-3 | | | | |
| 6 | | hour | | | Range: 0 to 23 Default: 0 | | | | |
| 7 | | min | | | Range: 0 to 59 Default: 0 | | | | |
| 8 | | Workday | | | Workday. Default 0 | | | | |
| 9 | | Time | | | Alarm clock reminder duration.  Default: 30. Range: 1-120. Unit: Second  Press SOS button to cancel | | | | |
| 10 | | Ring | | | Ringtone selection 1 to 3. Default: 1 | | | | |
| 11-N | | string | | | Describe in English. Maximum 32Bytes (EV06 Only) | | | | |
| WORKDAY (1 Byte) | | | | | | | | | |
| **Bit 7** | **6** | | **5** | **4** | | **3** | **2** | **1** | **0** |
| Reserved | SUN | | SAT | FRI | | THU | WED | TUS | MON |

### 3.2.7C Motion Alert Extra Param (0x7C) (CTM: EV04 3115)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x03/ Extendable |
| 2 | Key | 0x7C |
| 3~4 | warning time | 运动报警，预报警时间。单位: 秒。  Range: 3~180  Default: 3 |

### 3.2.80 Sub1G Settings (0x80) EV04S Only

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x05/ Extendable |
| 2 | Key | 0x80 |
| 3 | Enable | Bit0:  0 – Turn OFF Sub1G  1 – Turn ON Sub1G (Default)  Bit1: Button Low Battery Alert Report (Only once)  0 - Disable  1 – Enable (Default)  Bit2: Fall Sensor Detect Enable  0 - Disable  1 – Enable (Default) |
| 4 | Band | Band settings:  0 – 906 MHZ (Default)  1 – 868 MHZ |
| 5～6 | Sync word | Halo: 0x2DD4 |

### 3.2.81 Set Sub1G Device Whitelist (0x81) EV04S Only

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x06/ Extendable |
| 2 | Key | 0x81 |
| 3 | Flag | Bit7 : enable  bit[0-6]: index 取值小于10 |
| 4-7 | Device ID | 4bytes  Bit0~23: Device Type/ Serial Number  Bit24~31: Reserved  Example:  Device Type: 1  Serial Number:23456  Value: 0x56, 0x34, 0x12, 0x00 |

### 3.2.82 Set Algorithm token (0x82) (EV06 0122 Only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x41/Extendable |
| 2 | Key | 0x82 |
| 3-66 | Token | Example:  26da63608b55568a9e60f8d614bd4241d732b0aa15bf6567aa681bba10c127d7 |

### 3.2.83 Set Test Alarm Phone number(0x83)(CTM: EV06 0122 Only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | N-1 |
| 2 | Key | 0x83 |
| 3-N | Number | The phone number is less than 20byte. |

### 3.2.84 NFC Settings(0x84) EV12 Only

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | N-1 |
| 2 | Key | 0x84 |
| 3 | Enable | 0x00 – Turn OFF NFC (Default)  0x01 – Turn ON NFC |
| 4-N | Tag | Tag message language only support English.  Tag message length range 2 to 252. |

### 3.2.85 LoRA Settings(0x85) EV12 Only

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x03/ Extendable |
| 2 | Key | 0x85 |
| 3 | Enable | Bit0:  0 – Turn OFF Lora(Default)  1 – Turn ON Lora  Bit1: Button Low Battery Alert Report (Only once)  0 - Disable(Default)  1 – Enable |
| 4 | Band | Band settings:  0 – 868 MHZ (Default)  1 – 906 MHZ |

### 3.2.86 Set LoRA Device Whitelist (0x86) EV012 Only

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x08/ Extendable |
| 2 | Key | 0x86 |
| 3 | Flag | Bit7 : enable  bit[0-6]: index 取值小于10 |
| 4-5 | Device Type | 2bytes  Dock：0x0001  Band：0x0002 |
| 6~9 | Device ID | 4bytes  With range 0x00001 to 0xFFFFFFFF |

### 3.2.90 SIP Account Settings(0x90) (CTM: EV04 2728)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | N-1 |
| 2 | Key | 0x90 |
| 3 | Flag | Bit7: Enable  Bit0~6: Reserved |
| 4-N | Account info | ASCII String  Example: <sip:10000@192.168.0.50>;file\_id\_base=101 |
| SIP Account 账户信息配置 | | |

### 3.2.91 Authorized Numbers Additional SIP Information(0x91) (CTM:EV04 2728)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Byte No.** | | **Parameter** | | **Description** | |
| 1 | | Length | | N-1 | |
| 2 | | Key | | 0x91 | |
| 3 | | Flag | | Defined by Flag table below. Default: 0 | |
| 4-N | | Account info | | ASCII String  Example: 10000@192.168.0.50 | |
| Flag Table for Authorized Numbers | | | | | |
| Bit 0~3 | Value Range: 0-9.  The serial number of the contacts.  0000/0001/0010/0011/0100/0101/0111/1000/1001 | | Bit 4~6 | | Reserved |
| Bit 7 | | Enable |

### 3.2.D0 WIFI Hotspot Settings(0xD0) (Hub Only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | N-1 |
| 2 | Key | 0xD0 |
| 3-8 | Hotspot MAC | Wi-Fi hotspot mac address （Read Only） |
| 9 | WIFI Name length |  |
| 10-N | WIFI Name | length<32. Default: null |
| 设置/读取网关WIFI名称，读取网关热点MAC地址 | | |

### 3.2.D1 Ethernet Settings(0xD1) (Hub Only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x02/0x1C/ Extendable |
| 2 | Key | 0xD1 |
| 3 | IP Mode | Ethernet address config mode:   1. 自动（DHCP） 2. 手动（Manual） |
| 4~9 | Ethernet MAC | Ethernet mac address  (**Read Only**) |
| 10~13 | IP Address | IPV4 Address  自动模式：(**Read Only**) |
| 14~17 | Subnet Mask | 子网掩码  自动模式：(**Read Only**) |
| 18～21 | Gateway | 网关地址  自动模式：(**Read Only**) |
| 22～25 | Primary DNS | 首选DNS服务器地址  自动模式：(**Read Only**) |
| 26～29 | Secondary DNS | 二级DNS服务器地址  自动模式：(**Read Only**) |

### 3.2.D2 Internet Access Mode (0xD2) (Hub Only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x04/ Extendable |
| 2 | Key | 0xD2 |
| 3 | Access Mode1 | Connect internet mode:  0: OFF  1: LTE  2: WIFI Connect  3: Ethernet |
| 4 | Access Mode2 | … |
| 5 | Access Mode3 | …. |
| 网关按照优先级从高到低Access Mode1～3连接网络 | | |

### 3.2.D3 Internet Connect Status (0xD3) (Hub Only) Read Only

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x02/ Extendable |
| 2 | Key | 0xD3 |
| 3 | Connect status | 读取当前正在使用的联网方式  Connect internet mode:  0: OFF  1: LTE  2: WIFI Connect  3: Ethernet |

### 3.2.E0 LED Default State (0xE0)(EV202 Only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x02 |
| 2 | Key | 0xE0 |
| 3 | State | 0: OFF 1: ON  Led default state when power on |

### 3.2.F0 Read (0xF0)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | N-1 |
| 2 | Key | 0xF0 |
| n | Read key | No content. Read all parameters. Can be a combination of any parameter key. |

### 3.2.F1 Internal use enable control (0xF1) (Internal use only)

### 3.2.F2 Network update times (0xF2) (Internal use only)

### 3.2.F3 MCU Device ID (0xF3) (Internal use only)

### 3.2.F4 Get Algorithm Key From MCU Flash (0xF4) (Internal use only)

## 3.3 Services Command(0x03) key list

|  |  |  |
| --- | --- | --- |
| **Hex** | **Description** | **Remark** |
| 01 | Device ID | Each uploaded data must contain this key which is IMEI (0x10, default). It’s not fixed. Could be a Custom ID. |
| 10 | Heartbeat |  |
| 11 | Translates addresses |  |
| 12 | Get Timestamp | Get UTC timestamp from the server |
| 13 | Weather data |  |
| 21 | Cell Towers |  |
| 22 | WI-FI Towers |  |
| 24 | General data |  |
| 30 | OTA Update Firmware | EV202 EV09 EC02 only |
| 33 | Server download base mac to connect (CTM: EV07BX-3104) |  |

### 3.3.10 Heartbeat(0x10)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x02 |
| 2 | Key | 0x10 |
| 3 | 0x5A | Fixed data |
| It can only be sent from the device to the server and sent at the set time interval to maintain the connection. | | |
| Heartbeat with status format: [Device ID(0x01)](#_3.1.1_Device_ID) + Heartbeat(0x10) + [General data(0x24)](#_3.1.11_General_data(0x24)). For example:  AB 18 1F 00 AC 33 0B 01 ->Head  03 10 01 38 36 38 38 33 32 30 34 37 30 30 30 31 30 31 ->Device ID  02 10 5A ->Heartbeat  09 24 E4 51 E3 5C 10 00 A9 2C ->General data | | |
| The 07B serial devices won’t sent General Data. We will update this part in the future. Please contact us to confirm if it’s included. | | |

### 3.3.11 Translates Addresses(0x11)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x09 |
| 2 | Key | 0x11 |
| 3-6 | Latitude |  |
| 7-10 | Longitude |  |
| This is a request sent from the device | | |

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | N-1 |
| 2 | Key | 0x11 |
| 3-6 | Latitude |  |
| 7-10 | Longitude |  |
| 11-N | text | String text, end with ‘\0’ |
| This is a response sent from the server | | |

### 3.3.12 Get Timestamp(0x12)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x01 |
| 2 | Key | 0x12. sent by device |
| This is a request sent from the device | | |

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x05 |
| 2 | Key | 0x12, send by server |
| 3-6 | Timestamp |  |
| This is a response sent from the server | | |

### 3.3.13 Weather data (0x13) EV05 Only

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x09/0x11 |
| 2 | Key | 0x13, send by device |
| 3-10 | Lang | Language type |
| 11-14 | Latitude | Do not upload the latitude and longitude, the server obtains the last position (Optional) |
| 15-18 | Longitude | （Optional） |

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | N-1 |
| 2 | Key | 0x13, send by server |
| 3-6 | Timestamp | Last weather update time |
| 7-10 | Latitude |  |
| 11-14 | Longitude |  |
| 15-N | City | UTF-8 String |
| This is basic information about weather data sent from the server | | |

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 1+17\*n (Multiple records can be transmitted together) |
| 2 | Key | 0x14, send by server |
| 3-6 | Forecast time | Weather forecast time |
| 7-8 | Weather code（daylight） |  |
| 9-10 | Weather code（night） |  |
| 11-12 | Highest tempture | Celsius \*10, Signed number |
| 13-14 | Lowest tempture | Celsius \*10, Signed number |
| 15 | Relative humidity |  |
| 16 | UV intensity index |  |
| 17 | Wind strength |  |
| 18-19 | Wind direction |  |
| Weather data sent from the server, support multi record repeat from Byte No3 | | |

|  |  |  |
| --- | --- | --- |
| Code | 中文 | English |
| 100 | 晴 | Sunny/Clear |
| 101 | 多云 | Cloudy |
| 102 | 少云 | Few Clouds |
| 103 | 晴间多云 | Partly Cloudy |
| 104 | 阴 | Overcast |
| 200 | 有风 | Windy |
| 201 | 平静 | Calm |
| 202 | 微风 | Light Breeze |
| 203 | 和风 | Moderate/Gentle Breeze |
| 204 | 清风 | Fresh Breeze |
| 205 | 强风/劲风 | Strong Breeze |
| 206 | 疾风 | High Wind, Near Gale |
| 207 | 大风 | Gale |
| 208 | 烈风 | Strong Gale |
| 209 | 风暴 | Storm |
| 210 | 狂爆风 | Violent Storm |
| 211 | 飓风 | Hurricane |
| 212 | 龙卷风 | Tornado |
| 213 | 热带风暴 | Tropical Storm |
| 300 | 阵雨 | Shower Rain |
| 301 | 强阵雨 | Heavy Shower Rain |
| 302 | 雷阵雨 | Thundershower |
| 303 | 强雷阵雨 | Heavy Thunderstorm |
| 304 | 雷阵雨伴有冰雹 | Thundershower with hail |
| 305 | 小雨 | Light Rain |
| 306 | 中雨 | Moderate Rain |
| 307 | 大雨 | Heavy Rain |
| 308 | 极端降雨 | Extreme Rain |
| 309 | 毛毛雨/细雨 | Drizzle Rain |
| 310 | 暴雨 | Storm |
| 311 | 大暴雨 | Heavy Storm |
| 312 | 特大暴雨 | Severe Storm |
| 313 | 冻雨 | Freezing Rain |
| 314 | 小到中雨 | Light to moderate rain |
| 315 | 中到大雨 | Moderate to heavy rain |
| 316 | 大到暴雨 | Heavy rain to storm |
| 317 | 暴雨到大暴雨 | Storm to heavy storm |
| 318 | 大暴雨到特大暴雨 | Heavy to severe storm |
| 399 | 雨 | Rain |
| 400 | 小雪 | Light Snow |
| 401 | 中雪 | Moderate Snow |
| 402 | 大雪 | Heavy Snow |
| 403 | 暴雪 | Snowstorm |
| 404 | 雨夹雪 | Sleet |
| 405 | 雨雪天气 | Rain And Snow |
| 406 | 阵雨夹雪 | Shower Snow |
| 407 | 阵雪 | Snow Flurry |
| 408 | 小到中雪 | Light to moderate snow |
| 409 | 中到大雪 | Moderate to heavy snow |
| 410 | 大到暴雪 | Heavy snow to snowstorm |
| 499 | 雪 | Snow |
| 500 | 薄雾 | Mist |
| 501 | 雾 | Foggy |
| 502 | 霾 | Haze |
| 503 | 扬沙 | Sand |
| 504 | 浮尘 | Dust |
| 507 | 沙尘暴 | Duststorm |
| 508 | 强沙尘暴 | Sandstorm |
| 509 | 浓雾 | Dense fog |
| 510 | 强浓雾 | Strong fog |
| 511 | 中度霾 | Moderate haze |
| 512 | 重度霾 | Heavy haze |
| 513 | 严重霾 | Severe haze |
| 514 | 大雾 | Heavy fog |
| 515 | 特强浓雾 | Extra heavy fog |
| 900 | 热 | Hot |
| 901 | 冷 | Cold |
| 999 | 未知 | Unknown |

### 3.3.21 Cell Towers (0x21)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 4+5\*n, n is the number of Cell Towers. Range: 1-6 |
| 2 | Key | 0x21 |
| 3-4 | MCC |  |
| 5 | MNC |  |
| 6 | RXL |  |
| 7-8 | LAC |  |
| 9-10 | CELLID |  |
| Byte 6 to Byte 10 will be repeatedly displaying the Cell Tower information if more Cell Towers detected. | | |
| This is scanned Cell Tower information sent from the device | | |

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | N-1 |
| 2 | Key | 0x21 |
| 3-6 | Latitude |  |
| 7-10 | Longitude |  |
| 11-N | address | String |
| This is converted location data sent from the server | | |

### 3.3.22 WI-FI Towers (0x22)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 1+7\*n, n is the number of Wi-Fi MAC Addresses  Range: 1-6. |
| 2 | Key | 0x22 |
| 3 | RSSI | The measured current signal strength in dBm. Signed number |
| 4-9 | MAC | The MAC address of the Wi-Fi node. |
| Byte 3 to Byte 10 will be repeatedly displaying the Wi-Fi information if more Wi-Fi sources detected. | | |
| This is scanned Wi-Fi information sent from the device | | |

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | N-1 |
| 2 | Key | 0x22 |
| 3-6 | Latitude |  |
| 7-10 | Longitude |  |
| 11-N | address | String |
| This is converted location data sent from the server | | |

### 3.3.30 OTA Update Firmware(0x30) (EV202 EV09 EC02 only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | N-1 |
| 2 | Key | 0x30 |
| 3-6 | Last OTA timestamp | 0： No update yet |
| 7-10 | Last OTA status | 1. Update does not start yet 2. Downloading 3. Verification failed 4. Updating failed   200- Updated successfully |
| 11-22 | Firmware complier Date | ASCII String |
| 23-30 | Firmware complier Time | ASCII String |
| 31-N | Device number, Customer Code, current firmware version | EG:  EV09.8601.2009 |
| This is a request sent from the device | | |

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | N-1 |
| 2 | Key | 0x11 |
| 3 | OTA status | 1. New update; 2. Emergency update; 3. None update |
| 4-N | URL | The http URL address where the upgrade file is. |
| This is a response sent from the server | | |

### 3.3.33 Server download base mac to connect(0x33) (CTM: EV07BX-3104)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x08 |
| 2 | Key | 0x33 |
| 3 | status | 0 is disconnect, 1 is connect |
| 4-9 | mac | The small model，for example : F7:4C:29:DC:27:02, data[3] = 0x02 , data[4] = 27,  data[5] = 0xDC , data[6] = 29, data[7] = 0x4C , data[8] =0x F7 |
| This is set device pair to BLE base | | |

## 3.4 System Control Command(0x04) Key List

|  |  |  |
| --- | --- | --- |
| **Hex** | **Description** | **Remark** |
| 01 | Device ID | Device IMEI |
| 10 | Reset All Record | Remove historical data |
| 11 | Factory Recovery | Reset |
| 12 | Device Reboot |  |
| 13 | Find Me | Looking for equipment |
| 14 | Power Off |  |
| 15 | LED Control |  |
| 16 | Scan BLE |  |
| 17 | Firmware recovery | EV07B Only |
| 19 | Start auto-setting beacon location list |  |
| 1A | Start auto-setting Wi-Fi location list |  |
| 1B | Scan WIFI |  |
| 1C | Light | Pet Only |
| 1D | New Find Me |  |
| 1E | Motor Control | EC208 Only |
| 1F | Alarm TTS Speak | EV04 Only |
| 20 | File open | Internal Use Only |
| 21 | File close | Internal Use Only |
| 21 | Uploading BLE base | (CTM: EV07BX\_3104) |
| 22 | File write | Internal Use Only |
| 23 | File read | Internal Use Only |
| 24 | File seek | Internal Use Only |
| 25 | File check | Internal Use Only |
| 30 | OTA Trigger | EV05 / EV04 Use only |
| 31 | Heart data detect trigger | EV05 Only |
| 40 | Alarm control | CTM:EV04 0402 |
| 41 | Cancel SOS Advertising (CTM: EV7BX 4702 Only) |  |
| 42 | Beacon Scan |  |

### 3.4.01 Device ID (0x01)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x10 |
| 2 | Key | 0x01 |
| 3-17 | Device ID | Here is IMEI, 15 bytes |

### 3.4.10 Reset All Record(0x10)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x01 |
| 2 | Key | 0x10 |

### 3.4.11 Factory Recovery(0x11)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x01 |
| 2 | Key | 0x11 |

### 3.4.12 Device Reboot(0x12)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x01 |
| 2 | Key | 0x12 |

### 3.4.13 Find Me(0x13)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x01 |
| 2 | Key | 0x13 |

### 3.4.14 Power Off(0x14)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x01 |
| 2 | Key | 0x14 |

### 3.4.15 LED Control(0x15)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x02 |
| 2 | Key | 0x15 |
| 3 | State | 0: LED OFF  1: LED works according to the Settings |

### 3.4.16 Scan BLE(0x16)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x01 |
| 2 | Key | 0x16 |
| This is the command to activate the Scanning | | |

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 1+7\*n |
| 2 | Key | 0x16 |
| 3-8 | MAC | MAC address of the device connects to the base. |
| 9 | RSSI |  |
|  | MAC | MAC address of the device connects to the base. |
|  | RSSI |  |
| This is the BLE information scanned | | |

### 3.4.17 Firmware Recovery(0x17) EV07B Only

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x01 |
| 2 | Key | 0x17 |
| 恢复程序设置 | | |

### 3.4.19 Start auto-setting beacon location list (0x19)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | N-1 |
| 2 | Key | 0x19 |
| 3-6 | latitude | Int32 |
| 7-10 | longitude | Int32 |
| 11-N | Beacon description | String (max length=16bytes) end by '\0' |
| After receiving the command, the device will automatically search for surrounding beacons and add them to the beacon location list. All beacons share the same location information and device description。 | | |

### 3.4.1A Start auto-setting Wi-Fi location list (0x1A)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | N-1 |
| 2 | Key | 0x1A |
| 3-6 | latitude | Int32 |
| 7-10 | longitude | Int32 |
| 11-N | Wi-Fi description | String (max length=16bytes) end by '\0' |

### 3.4.1B Scan WIFI(0x1B)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x03 |
| 2 | Key | 0x1B |
| 3 | RSSI Threshold | Int8  Big than this value will return |
| 4 | Scan interval | Interval =0, Scan once  Interval >=1, unit is second |
| This is the command to activate the Scanning | | |

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | N-1 |
| 2 | Key | 0x1B |
| 3 | Flag | Bit7: 1=5G, 0=2.4G  Bit0~Bit6: index value |
| 4-9 | MAC | MAC address of the device connects to the base. |
| 10 | RSSI |  |
| 11-N | Name | WIFI name (UTF8). |
| This is the WIFI information scanned | | |

### 3.4.1C Light(0x1C)（Pet Only）

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x02 |
| 2 | Key | 0x1C |
| 3 | control | Bit 7 :enable  0x00-Off  0x01-brightness (CTM:EC208 Only)  0x02-super bright (CTM: EC208 Only)  0x03-slow flash (CTM: EC208 Only)  0x04-fast flash (CTM: EC208 Only)  0x05-super flash (CTM: EC208 Only)  0x06-SOS flash (CTM: EC208 Only)  0x80-Led Normal On |
|  | | |

### 3.4.1D New Find Me (0x1D)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x02 |
| 2 | Key | 0x1D |
| 3 | control | If 0 : disable, else :enable |
|  | | |

### 3.4.1E Motor Control (0x1E) (CTM:EC208)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x02 |
| 2 | Key | 0x1E |
| 3 | Control mode | 0- Off   1. Alert 2. Accent 3. Heart beat 4. Shake quick 5. Shake rapid 6. Shake staccato |

### 3.4.1F Alarm TTS Speak (0x1F) (EV04 Only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | N-1 |
| 2 | Key | 0x1F |
| 3 | Type | Reserve, 默认设置为0 |
| 4-N | Speak content | UTF8, length < 200 |

### 3.4.21 Uploading BLE base(0x21)(CTM:EV07BX\_3104)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 1+7\*n |
| 2 | Key | 0x21 |
| 3-8 | MAC | MAC address of the device connects to the base. |
| 9 | RSSI |  |
|  | MAC | MAC address of the device connects to the base. |
|  | RSSI |  |
| This is the BLE information scanned | | |

### 3.4.20 File open (0x20) (Internal use only)

### 3.4.21 File close (0x21) (Internal use only)

### 3.4.22 File write (0x22) (Internal use only)

### 3.4.23 File read (0x23) (Internal use only)

### 3.4.24 File seek (0x24) (Internal use only)

### 3.4.25 File check (0x25) (Internal use only)

### 3.4.30 OTA trigger(0x30) EV04 EV05 EC02 Only

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | N-1 |
| 2 | Key | 0x30 |
| 3-N | URL | The http URL address where the upgrade file is. |
| EV04-EV05-EC02 upgrade  **[OTA Server Required]**  http://<domain>/fi\_gsm\_ota/...... : 模块固件升级  http://<domain>/fi\_ota/...... : 整机固件升级  http://<domain>/fi\_voi/...... : 语音文件升级  http://<domain>/fi\_logo/...... : 开机Logo升级(CTM:EV06 0122) | | |

### 3.4.31 Heart data detect trigger(0x31) EV05 Only

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x01 |
| 2 | Key | 0x31 |
| Start heart detect | | |

### 3.4.40 Alarm control(0x40) (CTM:EV04 0402)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x02 |
| 2 | Key | 0x40 |
| 3 | Control code | 1. Start 2. Stop |
| 通过服务器控制报警开始，直到服务器下达停止指令 | | |

### 3.4.41 Cancel SOS Advertising (0x41) (CTM:EV7BX 4702 Only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x01 |
| 2 | Key | 0x41 |

### 3.4.42 Beacon Scan (0x42) (CTM: EV7BX 4702 Only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x01 |
| 2 | Key | 0x42 |
| This is the command to activate the Scanning | | |

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 1+7\*n (n value max 15) |
| 2 | Key | 0x42 |
| 3-8 | MAC | Beacon MAC address |
| 9-10 | RSSI |  |
| Upload to server | | |

### 3.4.43 Welfare check control(0x43) (CTM:EV04 4411)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x02 |
| 2 | Key | 0x43 |
| 3 | Control code | 1.Check in  0.Check out |
| 控制Welfare状态开/关。 当Welfare处于开启状态，下发check in，设备重新计时。 | | |

### 3.4.44 Unlock Sim(0x44) (CTM:EV04 4421)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x01 |
| 2 | Key | 0x44 |
| 解锁SIM卡，触发后，可以在切换其他SIM卡后重新锁定 | | |

## 3.9 No Encryption command (0x09) Optional

|  |  |  |
| --- | --- | --- |
| **Hex** | **Description** | **Remark** |
| 0D | BLE/USB Password Handshake |  |
| 0E | BLE/USB Extend Password Handshake | CTM: EV06 0122 |

### 3.9.0D BLE/USB Password Handshake

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x05 |
| 2 | Key | 0x0D |
| 3-6 | Password | Bit 30-0:  Range: 000000-999999. Default: 123456  Please convert the bit to Decimal system |

### 3.9.0E BLE/USB Extend Password Handshake （CTM:EV06 0122 Only）

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | N-1 |
| 2 | Key | 0x0E |
| 3-N | Password | Define different length password |

## 3.7E Firmware Update Command(0x7E) Key List Optional

|  |  |  |
| --- | --- | --- |
| **Hex** | **Description** | **Remark** |
| 10 | Start DFU with initial command |  |
| 11 | Transfer new firmware text |  |
| 12 | Validate new firmware |  |
| 13 | Query DFU state |  |
| 14 | Reset device |  |
| 15 | Get Pack Max length |  |
| The error code for DFU is 0x7F format. (in order to handle the error stream uniformly)  The correct return is 7E format  7E's length is fixed to 0 | | |

## 3.7F Negative Response Command(0x7F) Key List

|  |  |  |
| --- | --- | --- |
| **Hex** | **Description** | **Remark** |
| 00 | Success | If never use this code |
| Protocol Error | | |
| 11 | Version Invalid | Protocol version is not supported |
| 12 | Encryption Invalid | Encryption method is not supported |
| 13 | Length Error | Incorrect protocol length |
| 14 | Checksum Error | Checksum error |
| 15 | Command Invalid | Command not supported |
| 16 | Key Invalid | Key invalid |
| 17 | Key length error | Key length error |
| Value Error | | |
| 21 | Data Format Invalid |  |
| 22 | Data Size Error |  |
| 23 | Invalid State |  |
| 24 | Invalid Parameter |  |
| 25 | No Memory | Not enough storage |
| 26 | Sub Function not supported |  |
| 27 | GPS is not ready | No GPS positioning |
| 28 | Address resp |  |
| 30 | Out of service |  |
| 31 | Device unregister |  |
| 40 | BLE还没有交换密码 |  |
|  |  |  |
| F0 | Battery Power Low |  |
| F1 | File open failed | Internal Use Only |
| Meets the length key value format. | | |

## 3.20 Beacon config command(0x20) Key List (Internal use only)

|  |  |  |
| --- | --- | --- |
| **Hex** | **Description** | **Remark** |
| 02 | Beacon Version |  |
| 03 | Beacon TX Power |  |
| 04 | Beacon MAC |  |
| 05 | Beacon UUID |  |
| 06 | Beacon major and minor |  |
| 07 | Beacon RSSI 1m |  |

### 3.20.02 Beacon Version(0x02)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x02 |
| 2 | Key | 0x02 |
| 3 | version | 1byte |

### 3.20.03 Beacon TX Power(0x03)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x02 |
| 2 | Key | 0x03 |
| 3 | Tx Power(dB) | 1byte(int8)  Can be set : -40dBm, -20dBm, -16dBm, -12dBm, -8dBm, -4dBm, 0dBm, +3dBm and +4dBm |

### 3.20.04 Beacon MAC(0x04) (Read Only)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x07 |
| 2 | Key | 0x04 |
| 3-8 | MAC | 6byte |
| Only be read can’t be write | | |

### 3.20.05 Beacon UUID(0x05)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x07 |
| 2 | Key | 0x05 |
| 3-8 | UUID | 6byte |

### 3.20.06 Beacon major and minor(0x06)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x05 |
| 2 | Key | 0x06 |
| 3-4 | major | 2bytes |
| 5-6 | minor | 2bytes |

### 3.20.07 Beacon RSSI 1m(0x07)

|  |  |  |
| --- | --- | --- |
| **Byte No.** | **Parameter** | **Description** |
| 1 | Length | 0x02 |
| 2 | Key | 0x07 |
| 3 | Rssi\_1m | 1byte(int8)  Rssi value in distance of 1m |

# **4. Encryption Optional**

为保证TCP数据传输的安全性，需要对数据（Message body）进行加密处理。

上报数据内容Message body，使用AES算法加密后发送。接收端，根据Key ID查询到密钥，对Message body解密。

每条加密数据有特殊固定的头(0xA5)。加密报文的头如下：

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1B | 1B | 2B | 2B | 2B | 4B | 2B | 2B | NB |
| header（0xA5） | properties | length | Check sum | sequence id | Key id | Control Code | Head CRC | Message body |

数据安全高度依赖于密钥，密钥需进行严格管理，密钥管理方法：

1. 服务器生成16字节的密钥，每个密钥对应一个ID。

2. 服务器将密码保存在数据库中，管理员可以查看并导出。

3. 生产测试工具将密钥信息写入设备。写入内容包括：密钥ID、密钥、写入时间。写入后密钥ID可读，密钥内容不可读。重新写入密钥后，设备必须恢复出厂设置才能正常工作。

4. length 为加密后的长蔗

Head CRC内容：Header + Properties + length + checksum + sequence id + Key id + control code

## 4.1 Message properties

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Properties 1byte | | | | | | | |
| Bit 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| Encryption | | ERR flag | ACK flag | Version | | | |

Encryption:（保留）

ERR flag:（保留）

ACK flag（保留）

## 4.2 Key ID

|  |  |
| --- | --- |
| Bit31-24 | 23～0 |
| Type | ID in keyring |

Message Body数据传输加密类别和密钥ID：

|  |  |
| --- | --- |
| **Type** | **Description** |
| 0 | No use encryption, Key id in keyring invalid. |
| 1 | AES Dynamic key（保留） |
| 2 | AES static key |
| 3 | RSA public key（保留） |
| 4 | RSA private key（保留） |

## 4.3 Sequence ID

与body sequence id 一致

## 4.4 Control Code (CC)

请求定义

|  |  |
| --- | --- |
| **Type** | **Description** |
| 1 | 数据传输 |
| 2 | 密钥管理(保留) |

应答定义

|  |  |
| --- | --- |
| **Type** | **Description** |
| 200 | OK |
| 500 | 解密失败 |
| 501 | 解密后数据验证错误 |
| 403 | 无效密钥 |
| 404 | 密钥失效（保留） |

# Appendix 1

## CRC16 Checksum Calculation Algorithm:

### Shifted Algorithm

uint16\_t crc16\_compute(uint8\_t const \* p\_data, uint32\_t size, uint16\_t const \* p\_crc)

{

uint16\_t crc = (p\_crc == NULL) ? 0x0000 : \*p\_crc;

for (uint32\_t i = 0; i < size; i++)

{

crc = (uint8\_t)(crc >> 8) | (crc << 8);

crc ^= p\_data[i];

crc ^= (uint8\_t)(crc & 0xFF) >> 4;

crc ^= (crc << 8) << 4;

crc ^= ((crc & 0xFF) << 4) << 1;

}

return crc;

}

### Look-up table

static const uint16\_t CRC\_Table[ ] = {

0x0000, 0x1021, 0x2042, 0x3063, 0x4084, 0x50a5, 0x60c6, 0x70e7,

0x8108, 0x9129, 0xa14a, 0xb16b, 0xc18c, 0xd1ad, 0xe1ce, 0xf1ef,

0x1231, 0x0210, 0x3273, 0x2252, 0x52b5, 0x4294, 0x72f7, 0x62d6,

0x9339, 0x8318, 0xb37b, 0xa35a, 0xd3bd, 0xc39c, 0xf3ff, 0xe3de,

0x2462, 0x3443, 0x0420, 0x1401, 0x64e6, 0x74c7, 0x44a4, 0x5485,

0xa56a, 0xb54b, 0x8528, 0x9509, 0xe5ee, 0xf5cf, 0xc5ac, 0xd58d,

0x3653, 0x2672, 0x1611, 0x0630, 0x76d7, 0x66f6, 0x5695, 0x46b4,

0xb75b, 0xa77a, 0x9719, 0x8738, 0xf7df, 0xe7fe, 0xd79d, 0xc7bc,

0x48c4, 0x58e5, 0x6886, 0x78a7, 0x0840, 0x1861, 0x2802, 0x3823,

0xc9cc, 0xd9ed, 0xe98e, 0xf9af, 0x8948, 0x9969, 0xa90a, 0xb92b,

0x5af5, 0x4ad4, 0x7ab7, 0x6a96, 0x1a71, 0x0a50, 0x3a33, 0x2a12,

0xdbfd, 0xcbdc, 0xfbbf, 0xeb9e, 0x9b79, 0x8b58, 0xbb3b, 0xab1a,

0x6ca6, 0x7c87, 0x4ce4, 0x5cc5, 0x2c22, 0x3c03, 0x0c60, 0x1c41,

0xedae, 0xfd8f, 0xcdec, 0xddcd, 0xad2a, 0xbd0b, 0x8d68, 0x9d49,

0x7e97, 0x6eb6, 0x5ed5, 0x4ef4, 0x3e13, 0x2e32, 0x1e51, 0x0e70,

0xff9f, 0xefbe, 0xdfdd, 0xcffc, 0xbf1b, 0xaf3a, 0x9f59, 0x8f78,

0x9188, 0x81a9, 0xb1ca, 0xa1eb, 0xd10c, 0xc12d, 0xf14e, 0xe16f,

0x1080, 0x00a1, 0x30c2, 0x20e3, 0x5004, 0x4025, 0x7046, 0x6067,

0x83b9, 0x9398, 0xa3fb, 0xb3da, 0xc33d, 0xd31c, 0xe37f, 0xf35e,

0x02b1, 0x1290, 0x22f3, 0x32d2, 0x4235, 0x5214, 0x6277, 0x7256,

0xb5ea, 0xa5cb, 0x95a8, 0x8589, 0xf56e, 0xe54f, 0xd52c, 0xc50d,

0x34e2, 0x24c3, 0x14a0, 0x0481, 0x7466, 0x6447, 0x5424, 0x4405,

0xa7db, 0xb7fa, 0x8799, 0x97b8, 0xe75f, 0xf77e, 0xc71d, 0xd73c,

0x26d3, 0x36f2, 0x0691, 0x16b0, 0x6657, 0x7676, 0x4615, 0x5634,

0xd94c, 0xc96d, 0xf90e, 0xe92f, 0x99c8, 0x89e9, 0xb98a, 0xa9ab,

0x5844, 0x4865, 0x7806, 0x6827, 0x18c0, 0x08e1, 0x3882, 0x28a3,

0xcb7d, 0xdb5c, 0xeb3f, 0xfb1e, 0x8bf9, 0x9bd8, 0xabbb, 0xbb9a,

0x4a75, 0x5a54, 0x6a37, 0x7a16, 0x0af1, 0x1ad0, 0x2ab3, 0x3a92,

0xfd2e, 0xed0f, 0xdd6c, 0xcd4d, 0xbdaa, 0xad8b, 0x9de8, 0x8dc9,

0x7c26, 0x6c07, 0x5c64, 0x4c45, 0x3ca2, 0x2c83, 0x1ce0, 0x0cc1,

0xef1f, 0xff3e, 0xcf5d, 0xdf7c, 0xaf9b, 0xbfba, 0x8fd9, 0x9ff8,

0x6e17, 0x7e36, 0x4e55, 0x5e74, 0x2e93, 0x3eb2, 0x0ed1, 0x1ef0

};

uint16\_t crc16\_compute(const uint8\_t \*data, uint32\_t len, uint32\_t init)

{

uint16\_t crc16 = init;

for( uint32\_t i = 0; i < len; i++){

crc16 = CRC\_Table[ ((crc16 >> 8) & 0xff) ^ data[i] ] ^ ( crc16 << 8);

}

return crc16;

}