**Oviphone B2315L LoRaWAN Device Protocal**

**欧孚通信B2315L LoRaWAN设备协议**

**(V1.1) 2022-03-04**

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本协议合适用于欧孚B2315L LoRaWAN手环。若需要下行确认（全双工模式）或其他协议，请咨询欧孚通信（欧孚通信有其他定制协议的应用）。

This protocol use for Oviphone B2315L LoRaWAN wristband) .

If you need downlink confirmation (full-duplex mode) or other protocols, please check with Oviphone

设备功能的不断完善和丰富，本协议会不断更新，请从服务器下载最新版本。This document will continue updape, please download the newest version. <http://aiday.com.cn/Help/api/Device/LORA/>

 手环加网方式（wristband register network）：Activation by Personalization (独立激活方式 ABP)

 Default APPSKEY： 2B7E151628AED2A6ABF7158809CF4F3C

Default NWKSKEY：735F2F22103042BE724197AC1727EA94

If you need special KEY, please contact with Oviphone.

# 报文标示符(Message ID)

|  |  |
| --- | --- |
| **Message ID** | **Description** |
| 0xBB | 固件版本号上传 （Device Firmware Version Upload） |
| 0xF6 | 电量,计步和信号强度上传 (Battery Power, Predometer, Signal Level Upload) |
| 0x03 | GPS/北斗定位数据上传 (GPS/Glonass Data Upload) |
| 0xC2 | 心率 血压数据上传 （Heart rate, Blood Pressure Data） |
| 0xBA | 温度数据上传 (Temperature Upload) |
| 0x02 | 告警数据上传 (Warning Upload) |
| 0xD6 | 蓝牙定位信息(LBE Location) |
| 0xC1 | 下行消息查询 (Download Message Status Check ) |
| 0xD2 | 下行消息/设置报文 (Message, Set periodic positioning) |
|  |  |

# 上行报文(Upload Messages: Device send data to Server)

## 2.1 固件版本号(Device Firmware Version Upload）(0xBB)

说明：开机报文，上传固件版本号 （device power on, upload the firmware version）

payload contents

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Byte offset | Format | Name | Unit | Decription |
| 1 | UINT8 | Version\_len | / | 软件版本号长度 |
| N | ASCII[n] |  | / | 软件版本号 |

Example：

 BB 10 42323331332E4F563836382E54483031

 上报内容 B3213.OV868.TH01

## 2.2电量,计步和信号强度上传 (Battery Power, Predometer, Signal Level Upload) (0xF6)

payload contents

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Size(Bytes) | Format | Name | Scale | Unit | Decription |
| 2 | U16 | Bat\_volt |  | -/- | 电池电量格数(Battery Level) |
| 4 | U32 | Step\_num |  |  | 记步数据(Prodemeter Step) |
| 1 | U8 | Signal\_strength |  |  | 信号强度(Signal level) |
| 4 | Int32 | timestamp |  |  | 时间戳小端(timestamp, little endian) |

Example： f60300940400005028F2CD5F

F6 : MSGID

0300 : 小端（littele Endian），电量3格(Battery Level 3).

Value 0 - 3 Mean 0% - 100% (10% 30% 60% 100%)；

94040000： 小端（littele Endian），0x00000494：Prodometer 1172步 (step)；

50 ： 信号强度80%( Signal Level 80%(

28F2CD5F： 时间戳：北京时间2020-12-07 17:13:12 (Timestamp: Beijing time2020-12-07 17:13:12)

## 2.3 GPS/北斗位置上传(GPS/Glonass Location upload) (0x03)

payload contents

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Byte offset | Format | Name | Scale | Unit | Decription |
| 8 | Double | lon |  | -/- | longitude |
| 8 | Double | lat |  | 　 | latitude |
| 1 | U8 | north\_south |  |  | /\*N or S\*/ |
| 1 | U8 | east\_west |  |  | /\*E or W\*/ |
| 1 | U8 | status |  |  | /\*A or V\*/ |
| 4 | U32 | Timestamp  |  |  | 时间戳(Timestamp) |

Example： 0322fb20cb827a5c4021ea3e00a99536404e4541cf084e5f

03: MSGID

22fb20cb827a5c40 : 小端（littele Endian），0x405c7a82cb20fb22，数据为double类型，需要转为浮点数，longitude值为：113.9142330000000 （dd.dddd格式）；(Double type, need change the data to Floating point

21ea3e00a9953640 : 小端（littele Endian），0x403695a9003eea21，数据为double类型，需要转为浮点数，longitude值为：22.5846100000000（dd.dddd格式）；(Double type, need change the data to Floating point)

4E : ASCII 编码表述，南、北纬度，范围为/\*N or S\*/，表示为：N（北纬）；

(ASCII code, south and north latitude, the range is /\*N or S\*/,: N (north latitude))

45 : ASCII 编码表述，东、西经度，范围为/\*E or W\*/，表示为：E（东经）；

 (ASCII code, east and west longitude, range is /\*E or W\*/: E (east longitude))

41 : ASCII 编码表述，定位状态，范围为/\*A or V\*/，表示为：A（有效）；

 (ASCII code representation, positioning status, range is /\*A or V\*/, expressed as: A (valid))

cf084e5f : 小端（littele Endian），0x5f4e08cf，Unix时间戳转换后，值为：2020/9/1 16:39:43 ；

## 2.4 心率血压上传(Heart rate, Blood Pressure)(0xC2)

payload contents

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  Byte offset | Format | Name | Scale | Unit | Decription |
| 2 | U16 | bp\_high | - | - | 收缩压：2byteSystolic Blood |
| 2 | U16 | bp\_low | - | - | 舒张压：2byteDiastolic Blood |
| 2 | U16 | Bp\_heart | - | - | 心率：2byteHeart rate |
| 4 | U32 | Timestamp |  |  | 时间戳Timestamp |

 例：C2 7500 4D00 4800 28F2CD5F

 C2 : MSGID；

 7500 : 小端（littele Endian）， 0x0075 收缩压 = 117 (Systolic Blood Pressure Value 117)

 4D00 : 小端（littele Endian）， 0x004D，舒张压 = 77 (Diastolic Blood Pressure Value 77)

 4800 : 小端（littele Endian），0x0048，心率值72 (Heart Rate Value 72)

 28F2CD5F : 时间戳：北京时间2020-12-07 17:13:12 (Timestamp: Beijing time2020-12-07 17:13:12)

## 2.5温度上传（Temperature）（MsgId=0xBA）

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Byte size | Format | Name | Scale | Unit | Decription |
| 1 | U8 | 时间戳标识 | 必选Must |  | 00 - 带时间戳with timestamp；01 - 不带时间戳-without timestamp |
| 4 | Int32 | 时间戳timestamp | 可选Optional |  | 如果时间戳标识为01，则不需要此字段timestamp ID is 01, this field is not required |
| 1 | U8 | 温度类型（Temp. type） | 必选Must |  | 1：表示上传体表温度和体温：(1: upload wrist and body temp).2：表示上传体表温度，体温和环境温度2:upload wrist, body and environment temp. |
| 2 | S16 | 体表温度（wrist Temp.） | 可选Optional |  | 体表温度小数点后面保留一位 （×10） 上报值为整数，根据温度类型决定是否有此字段One digit after the decimal point is reserved for body surface temperature (×10). The reported value is an integer. It is determined whether there is this field according to the temperature type |
| 2 | S16 | 体温（Body Temp.） | 可选Optional |  | 体温小数点后面保留一位 （×10） 上报值为整数，根据温度类型决定是否有此字段One digit after the decimal point is reserved for body surface temperature (×10). The reported value is an integer. It is determined whether there is this field according to the temperature type |
| 2 | S16 | 环境温度(environment temperature) | 可选Optional | / | 环境温度小数点后面保留一位 （×10） 上报值为整数，根据温度类型决定是否有此字段One digit after the decimal point is reserved for body surface temperature (×10). The reported value is an integer. It is determined whether there is this field according to the temperature type |

## 2.6报警数据上传(Alarm message)（MsgId=0x02）

|  |  |  |  |
| --- | --- | --- | --- |
| Size(Bytes) | Format | Name | Drscription |
| 2 | U16 | Upl\_warn | Bitfield see below |
| 4 | U32 | Timestamp | 时间戳(小端优先) |

Bitfield WRN:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 15 |  |  |  |  |  |  | 8 |  |  |  | 4 |  |  | 1 | 0 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| bit | Name | Description | 调整后的16进制Hexadecimal | 十进制Decimal |
| 8 | 设备佩戴Wear status | 设备佩戴Wear status | 0100 | 1\*256=256 |
| 4 | 摘掉设备Takeoff status | 摘掉设备Takeoff status | 0010 | 1\*16=16 |
| 2 | 关机 Power off | 关机Power off | 0004 | 4 |
| 1 | SOS |  | 0002 | 2 |
| 0 | 低电量 Low Power | 低电量Low Power | 0001 | 1 |

 Example**：**

 关机报文（Power off） 02040028F2CD5F

 低电报文（Low battery） 02010028F2CD5F

 佩戴报文（Wear status） 02000128F2CD5F

 摘掉报文（Takeoff status） 02100028F2CD5F

## 2.7蓝牙定位信息(LBE Location)（MsgId=0xD6）

|  |  |  |  |
| --- | --- | --- | --- |
| Size(Bytes)  | Format  |  Name  | Decription |
| 1 | U8 | Type | 目前固定为0 (Fix value 0) |
| 4 | Int32 | Utc | Utc时间戳 (UTC timestamp) |
| 1 | U8 | Total\_PackCount | 当前时间的包总数 (total time package) |
| 2 | U16 | Major[0] | Major |
| 2 | U16 | Minor[0] | Minor |
| 1 | U8 | Rssi[0] | Rssi |
| 2 | U16 | Major[1] | Major |
| 2 | U16 | Minor[2] | Minor |
| 1 | U8 | Rssi[2] | Rssi |

 Example**：**

D6 00 70DAF861 01 4327 1794 ac 4327 3094 aa 6a

 D6: MSGID；

 00: 固定

 70DAF861 时间戳：北京时间2022-02-01 15:00:00 (Timestamp: Beijing time 2022-02-01 15:00:00)

 01 当前有1笔蓝牙定位信息

 4327: 小端（littele Endian）， 0x2743 major = 10051

 1794: 小端（littele Endian）， 0x9417 minor = 37911

 ac -85 (rssi)

## 2.8 查询下行消息(Download Message Check) (0xC1)

|  |  |
| --- | --- |
| Message | 消息查询  |
| Description | 消息查询 |
| Direction | Terminal => Terminal Server |
| Message structure | Message ID | Payload |
| 0xC1 | / |

# 下行报文（Download Message）

* 1.

## 3.1下行消息（Send Message to Device） (MSGID=0xD2)

payload contents

|  |  |  |  |
| --- | --- | --- | --- |
| Size(Bytes)  | Format  |  Name  | Decription |
| 1 | U8 | type | 0x16  |
| 1 | U8 | Len | 内容长度 (Contect Length) |
| U8 \* len |  | Data | 内容（UCS2编码）最多支持20 bytes(content, UCS2 code, Maxium 20 bytes) |

 Example**：**

 D2 16 0C 0047005000536d4b8bd54e2d

 长度（Length）为 : 0C

 内容为（Contect） ： GPS测试中 （GPS Testing）

## 3.2设置周期定位（Set periodic positioning）(MSGID=0xD2)

|  |  |  |  |
| --- | --- | --- | --- |
| Size(Bytes) | Format |  Name  | Decription |
| 1 | U8 | type | 0x17 |
| 1 | U8 | Len | 内容长度 (Contect Length) |
| 1 | u8 | enable | 是否启用(Enable or not) | 　时间段1Time1 |
| 1 | U16 | Interval | 时间间隔（分钟）(Period Minutes) |
| 1 | u8 | time\_start\_h | -时Hour |
| 1 | u8 | time\_start\_m | -分Minute |
| 1 | u8 | time\_end\_h | -时Hous |
| 1 | u8 | time\_end\_m | -分Minute |
| 1 | u8 | 　enable | 是否启用(Enable or not) | 时间段2Time2 |
| 1 | U16 | Interval | 时间间隔（分钟）(Period Minutes) |
| 1 | u8 | time\_start\_h | -时Hour |
| 1 | u8 | time\_start\_m | -分Minute |
| 1 | u8 | time\_end\_h | -时Hour |
| 1 | u8 | time\_end\_m | -分Minute |

 Example**：**

 D2 17 0E 01 03 00 00 00 13 00 00 00 00 00 00 00 00

 0点到19点，每隔3分钟定位一次(0 o'clock to 19 o'clock, positioning once every 3 minutes)

## 3.3设置定位优先(MSGID=0xD2)

|  |  |  |  |
| --- | --- | --- | --- |
| Size(Bytes) | Format |  Name  | Decription |
| 1 | U8 | type | 0xCE |
| 1 | U8 | Len | 内容长度 (Contect Length) |
| N | U8 |  | 01 --gps 02 --wifi 03 --蓝牙信标 |

Example**：**

D2 CE 02 01 03

 01 为GPS, 03 为蓝牙信标，所以当前定位顺序是优先启动GPS，如GPS定位失败再启动蓝牙定位。

## 3.4设置时区 (MSGID=0xD2)

|  |  |  |  |
| --- | --- | --- | --- |
| Size(Bytes) | Format |  Name  | Decription |
| 1 | U8 | type | 0x06 |
| 1 | U8 | Len | 内容长度 (Contect Length) |
| 1 | S8 |  | 时区  |

Example**：**

 D2 06 01 F8

 设时区为 -5