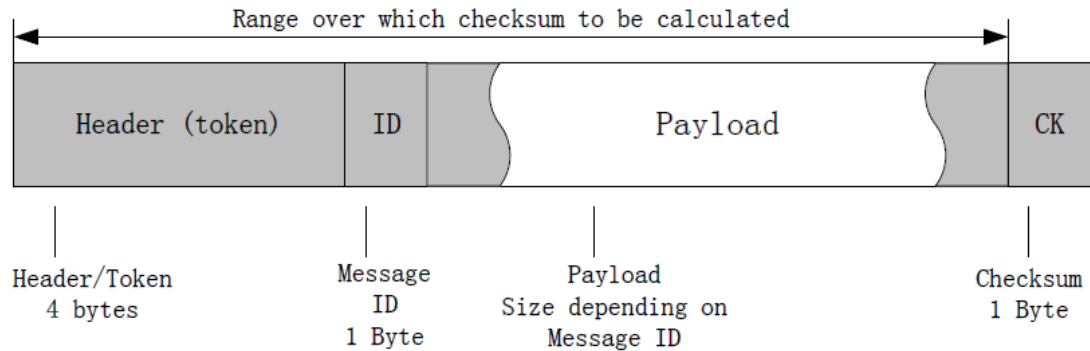


1.Data frame



Description:

- Header with fixed value BDBDBDBD
- Message ID: Protocol id
- Payload: Specific message content, size depending on message ID. [The variables inside are all in little-endian mode](#)
- CK: Checksum 1 byte, for example:

```
Ck_sum = 0
```

```
For(i=0; i<N; i++)
```

```
{
```

```
ck_sum = ck_sum + Buffer[i]
```

```
ck_sum = ck_sum % 0x100
```

```
}
```

```
Ck_sum = 0xFF - ck_sum
```

```
Return ck_sum
```

2.Message

2.1 Uplink power info （MSGID=0XF6）

Payload contents

Byte offset	Format	Name	Scale	Unit	Description
2	u16	Bat_volt		-/-	Power percentage
4	U32	Step_num			Number of steps
1	U8	Signal_strength			Signal strength
4	Int32	Timestamp			little-endian mode

eg : bdbdbdbdf60300940400005028F2CD5F2a

F6 --- MSGID

0300 --- Little-endian , 0x0030) The power level is 3 , and the reported power level value 0-5 corresponds to 0%-100% (0% 20% 40% 60% 80% 100%);

94040000 --- Little-endian , 0x00000494, 1172 steps ;

50 --- Signal strength 80% ;

28F2CD5F —— time stamp : Beijing time: 2020-12-07 17:13:12

2a --- check code

2.2 Uplink GPS location （MSGID=0X03）

Payload contents

Byte offset	Format	Name	Scale	Unit	Description
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			Time stamp

eg :

bdbdbdbd0322fb20cb827a5c4021ea3e00a99536404e4541cf084e5f13

03 ---MSGID

22fb20cb827a5c40 --- Little-endian , 0x405c7a82cb20fb22 , Data type: double, need to be converted to floating point, , longitude : 113.9142330000000 (dd.dddd format) ;

21ea3e00a9953640 --- Little-endian , 0x403695a9003eea21 , data type: double need to be converted to floating point, , longitude : 22.5846100000000 (dd.dddd format) ;

4E --- ASCII code , south and north latitude, the range is /*N or S*/, expressed as: N (north latitude);

45 --- ASCII code , east and west longitude, range is /*E or W*/, expressed as: E (east longitude);

41 --- ASCII code , positioning status, range is /*A or V*/, expressed as: A (valid);

cf084e5f --- Little-endian, 0x5f4e08cf, after Unix timestamp conversion, the value is: 2020/9/1 16:39:43;

13 --- Check code;

2.3 Uplink heartrate and blood pressure （MSGID=0XC2）

Payload contents

Byte offset	Format	Name	Scale	Unit	Description
2	U16	bp_high	-	-	Systolic blood pressure: 2byte
2	U16	bp_low	-	-	Diastolic blood pressure: 2byte
2	U16	Bp_heart	-	-	heartrate: 2byte
4	Int32	timestamp			timestamp

eg : bdbdbdbdc200000000480028F2CD5F01

C2 --- MSGID ;

0000 --- Little-endian , 0x0000 , Systolic blood pressure (reserved, no function) ;

0000 --- Little-endian , 0x0000 , Diastolic blood pressure (reserved, no function) ;

4800 --- Little-endian , 0x0048 , heartrate 72

28F2CD5F —— time stamp : Beijing time: 2020-12-07 17:13:12

01 --- check code

2.4 Set location cycle（MSGID=0X17）

Byte offset	Format	Name	Scale	Unit	Description	
1	u8	enable	-/-	-/-	Enable	Time period 1
2	U16	Interval			Time interval（mins）	
1	u8	time_start_h			-h	
1	u8	time_start_m			-min	
1	u8	time_end_h			-h	
1	u8	time_end_m			-min	
1	u8	enable	-/-	-/-	Enable	Time period 2
2	U16	Interval			Interval（mins）	
1	u8	time_start_h			-h	
1	u8	time_start_m			-min	
1	u8	time_end_h			-h	
1	u8	time_end_m			-min	
1	u8	enable	-/-	-/-	enable	Time period 3
1	U16	Interval			Interval（mins）	
1	u8	time_start_h			-h	
1	u8	time_start_m			-min	
1	u8	time_end_h			-h	
1	u8	time_end_m			-min	
1	u8	enable	-/-	-/-	enable	Time period 4
1	U16	Interval			interval（mins）	
1	u8	time_start_h			-h	
1	u8	time_start_m			-min	
1	u8	time_end_h			-h	
1	u8	time_end_m			-min	

eg：

bd bd bd bd 17 01 03 00 00 00 13 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

00 00 00 dd

0 o'clock to 19 o'clock, positioning once every 3 minutes

2.5 Uplink SOS message (MSGID=0XB5)

Byte offset	Format	Name	Description
1	U8	Status	status: 1:SOS
4	Int	Timestamp	timestamp

bdbdbdbdb50128F2CD5F55

28F2CD5F — time stamp: **Beijing time: 2020-12-07 17:13:12**

2.6 Bluetooth location (MsgId=0xD6)

Payload contents:

Format	Name	Scale	Description
U8	type	1	Currently fixed at 0
U8	Total_groups	1	The total number of groups, there may be multiple groups and multiple ibeacons in each group
Int32	utc	4	Utc time stamp、 Little-endian
U8	Total_PackCount	1	Total number of packages at the current time
U8	Major[0]	2	Major
U8	Minor[0]	2	Minor
U8	Rssi[0]	1	Rssi
U8	Major[1]	2	Major
U8	Minor[1]	2	Minor
U8	Rssi[1]	1	Rssi
Int32	utc	4	Utc time stamp
U8	Total_PackCount	1	Total number of packages at the current time
U8	Major[0]	2	Major

U8	Minor[0]	2	Minor
U8	Rssi[0]	1	Rssi

eg :

bdbdbdbdd60001be20315f0443271794ac43273094aa4327b956a54327fe94a56a

2.7Uplink alerting message (MsgId=0x02)

Message	LNK-WRN			
Description	Terminal uploads its warnings to terminal server.			
Firmware				
Direction	Terminal => Terminal Server			
Payload length	2 bytes			
Message	Header	Message ID	Payload	Checksum
structure	Token	0x02	See below	CK_sum

Payload contents

Byte Offset	Format	Name	Scale	Unit	Drscription
2	x16	Upl_warn	-	-	Bitfield see below
4	Int32	Timestamp			timestamp

Bitfield WRN:

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

Bit	Name	Description	Code
10	Exit sleep mode		
9	Enter sleep mode		
8	Wearing device	Wearing device	7
7	SOS	Reserved	8
4	Remove device	Remove device	11

2	Power off	Power off	13
1	SOS		14
0	Low power	Low power	15

Power off the device: BDBDBDBD02040028F2CD5F C1

Lower power alarm: BDBDBDBD02010028F2CD5F C4

Wear device: BDBDBDBD02000128F2CD5F C4

Remove device: BDBDBDBD02100028F2CD5F C4

Enter sleep mode : BDBDBDBD02 0002 28F2CD5F C4

Exit sleep mode : BDBDBDBD02 0004 28F2CD5F C4

2.8 Package without location info (MsgId=0xC7)

Byte offset	Format	Name	Description
1	U16	Status	No positioning: the value is fixed value 0x0020
4	Int32	timestamp	timestamp

eg : BDBDBDBDC72000**28F2CD5F**AB

3. Server time synchronization

3.1 Request time synchronization

Byte offset	Format	Name	Description
1	U8	HEADER	filling : 0xFF
1	U8	SeqId	filling : 0x00
1	U8	End	filling : 0xFF

eg : FF00FF

3.2 Reply to time synchronization request

Byte offset	Format	Name	Description
1	U8	HEADER	filling : 0xFF
1	U8	SeqId	filling : 0x00
2	U16	years	Year
1	U8	month	Month
1	U8	Day	day
1	U8	time	hour
1	U8	Minute	minute
1	U8	Seconds	seconds
1	U8	End	filling : 0xFF

eg : FF1007E409020B1B28FF

FF --- Header

10 --- SeqId

07E4 --- Year , value : 2020

09 --- month , value : 09

02 --- day , Value : 02

0B --- hour , Value : 11

1B --- minute , Value : 27

28 --- seconds , Value : 40

FF --- End

※Note: After the device is turned on, it will automatically send a time synchronization request. Sync device time after receiving reply.