NAVIECARE

LoRa GPS Tracker

GF8945 Payload Protocol

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Document Revision Record

Version	Date	Description	
V1.0.0	2018-8-23	Preliminary version	Michael
V1.3.0	2018-9-27	Optimized compression algorithm	Michael

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Introduction

The goal of this document is to detail the messages sent between GF8945 sensor and a LoRa Network server.

1. Sensor-To-Server Messages

1.1 Frame structure:

Name	Header	UTC	latitude	longitude	Speed	direction	altitude	Msg type	Msg Length	Data	Check code
Type	Uint8_t	Uint32_t	Uint32_t	Uint32_t	Uint8_t	Uint16_t	Uint16_t	Uint8_t	Uint8_t	Uint8_t* N	Uint8_t
Unit	-	S	Degree *100000	Degree*10 0000	Km/h	Degree	Meter	-	-	-	-
Byte	1	4	4	4	1	2	2	1	1	N	1

Characters sending order: high in the front, low in the back.

1.2 Payload description

1) Header

Head of frame , started with 0xAA.

2) UTC

Universal Time Coordinated , world standard time, such as: 1505285997(0x59B8D76D). The corresponding Beijing time is 2017/9/13 14:59:57.

3) Latitude

The latitude value obtained by GPS is in ddd°mm.mmm' format , need to convert into ddd.ddddd °

format , the hexadecimal obtained by multiplying 1000000 represents the protocol latitude value.

eg : ddd°mm.mmm' format 2235.10896 convert into ddd.ddddd ° format is 22.585149. 22.585149*1000000=22585149 , Convert to hexadecimal is 0x1589F3D

4) Longitude

The longitude value obtained by GPS is in ddd°mm.mmm' format , need to convert into ddd.ddddd ° format , the hexadecimal obtained by multiplying 1000000 represents the protocol longitude value.

eg : ddd°mm.mmm' format 11354.79188 convert into ddd.ddddd ° format is 113.913198 , 113.913198*1000000=113913198 , Convert to hexadecimal is 0x6CA2D6E

5) Speed

Express the speed in one byte, range 0---255;

Unit: km/h.

6) Direction

Range: from 0 to 359. For example: 138 (0x8a).

7) Altitude

GPS altitude

Unit: m

8) Message type

Reserved value for functional status representation.

9) Message length

Record the data length, from 0x00 to 0xFF. If the data length is 0, the data is empty.

10) Data

Contains data content. Such as 1.3 function description.

11) CRC

The CRC value is the check code and is the sum of all bytes from UTC to RFU.

1.3 Command List

1) Alarm message

Msg Typ	Msg Length	Data	
0x01	1	0x00	Default
		0x01	SOS alert
		0x02	Lower power alert
		0x04	Reserved
		0x08	Reserved

2) Sensor information

Msg Type	Msg length	Data
0x02	2	Uint16_t(Step count)
	4	Uint32_t(Business ID)
	1	Uint8_t(Electric percentage)

2. Server-to- Sensor Message

2.1Payload format

Name	Header	Msg Type	Msg Length	Data	Check code
Type	Uint8_t	Uint8_t	Uint8_t	Uint8_t * N	Uin8_t
Length	1	1	1	N	1

2.2 Description

1) Header

Head of frame , started with 0xBB。

2) Message Type

Used to indicate the function performed by this data frame. The analysis of the data needs to be performed according to the message type.

3) Message Length

Record the data length, from 0x00 to 0xFF. If the data length is 0, the data is empty.

4) Data

Store the content of message type in bytes , the length is controlled by the message length.

5) CRC

The CRC value is the check code and is the sum of all bytes from UTC to RFU.

3. Command List

1) Uplink period setting

Unit:s , Default value: 300 s.

Msg Type	Msg Lenght	Data
0xB0	2	From 30 to 65535

Note: The Lora server recommends sending control commands by using the comfirmed frame format.