



# LoRa Temp&RH Sensor

## LTH5200 Payload Protocol

Version: V1.6.0

Date: 2019-1-27

## Document Revision Record

Version	Date	Description	
V1.0.0	2018-10-23	Preliminary version	Gavin
V1.6.0	2019-1-27	Optimized compression algorithm	Gavin

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## Payload descriptions

The ENVIRONNEMENT sensor transmits its data in raw format on different public and private LoRaWAN™ networks. The section below shows you how to decode the frames (Payload) sent between LTH5200 sensor and a LoRa network server.

### 1.Frame Structure

#### 1.1 Frame structure

Item	Header	Object type	Data	Tail
Type	Uint8_t	Uint8_t	Uint8_t	Uint8_t
Bytes	1	1	N	1

#### 1.2Explanation of frame structure

##### 1) Header

Expressed with a fixed byte of 0xFF, representing the beginning of a frame..

##### 2 ) Object type

Indicate the function performed by the frame.

Object Type	Description	Uplink/Downlink
0x00	Power on,Request platform to update device time	Uplink
0x01	Temperature , humidity and power alarm report	Uplink
0x02	Temperature ,humidity and power batch report	Uplink
0x04	Device response to downlink message ACK	Uplink
0x05	The device modifies the maximum and minimum values	Uplink
0x10	Platform request device update time	Downlink
0x11	Temperature& humidity range setting	Downlink
0x12	Modify data uplink frequency	Downlink
0x13	Update time request	Downlink
0x14	Change duty cycle	Downlink
0x15	Temporary release of device alarm	Downlink

### 3 ) Data

Store data in bytes.

### 4 ) Tail

Expressed with a fixed byte of 0xFF, representing the end of a data frame.

## 2 Sensor to Server Messages(Uplink)

### 2.1 Request platform update device time

Frame structure	Value	Type	Description
Object type	0x00	UInt8_t	
Data	NULL		After the device is successfully registered, the device send a data packet to obtain the platform time.

### 2.2 Reporting alarm

Frame structure	Value	Type	Description
Object type	0x01	UInt8_t	
	Time	UInt32_t	World standard time, such as: 1505285997 (0x59B8D76D). The corresponding Beijing time is 2017/9/13 14:59:57.
	Temperature	UInt16_t	Temperature range-20 ~90.
	Humidity	UInt8_t	Humidity range 0~99.
	Battery	UInt8_t	Battery range 0 -100.
	Alarm	UInt8_t	See table 1

**Table 1**

Byte	Define	Description
0	1 : Alarm when exceeding the max humidity	Maintained until the alarm condition is released
1	1 : Alarm when exceeding the max temperature	Maintained until the alarm condition is released
2	1 : Alarm when falls below min humidity	Maintained until the alarm condition is released
3	1 : Alarm when falls below min temperature	Maintained until the alarm condition is released

4	1 : Alarm when battery falls below 20%	Maintained until the alarm condition is released
5-7	Remain	

### 2.3 Batch reporting

Frame structure	Value	Type	Description
Object type	0x02	UInt8_t	
Actual number of packets	number of packets	UInt16_t	
Data	Data	N	Time, DWORD, only upload the first package time. The temperature is divided into high byte and low byte. The byte length indicates the length of the data. The low byte temperature data is the fractional part. The result of the analysis needs to be divided by 10. When there is repeated data, the repeated portion after the uploaded data is denoted by A, A1 indicates that one data is repeated, and AF indicates that 15 data is repeated. The humidity is only one byte. The length of the humidity byte indicates the length of the humidity data. The analysis of the humidity data is the same as the temperature data. When the data is repeated, it is represented by An, and the power is the same as above.

Header|Object type |actual number of packets|Time stamp|High byte temperature|High byte temperature|Temperature high byte data|Temperature low byte data|Humidity data length|Humidity data|Power data length|Power data

**Example :** FF| 02 | 00 78 | 5b d0 61 c3 | 0B | 11 AF AF AF AF 12 AF AF AF 11 AC| 0C| 08 AF 09 AF 00 AF AF 01 AF AF AF AB | 0C | 3C AF AF AF AF 3D AF AF AF 3B AC | XX | 3C AF AF AF AF AF AF AF AE

## 2.4. Device response message

Frame structure	Value	Type	Description
Object type	0x04	Uint8_t	
Data	DownLinkcounter	Uint32_t	Frame count
	result	Uint8_t	success : 1 , fail : 0

## 2.5. Temperature& humidity range setting

Frame structure	Value	Type	Description
Object type	0x05	Uint8_t	
Data	Max/Min Temperature& Humidity	Uint32_t	Format : Max humidity,max temperature, min humidity, min temperature

## 3. Server to Sensor Messages ( Downlink)

### 3.1 Update device time

Frame structure	Value	Type	Description
Object type	0x10	Uint8_t	
Data	Year	Uint16_t	After 2000
	Time	Uint8_t [5]	Month, day, hour, minute, second.

### 3.2 Temperature& humidity range setting

Frame structure	Value	Type	Description
Object type	0x11	Uint8_t	
Data	Max Humidity	Uint8_t	Maximum Humidity : 0-99
	Max Temperature	Uint8_t	Maximum Temperature : (-20) - 90 Celsius
	Min Humidity	Uint8_t	Minimum humidity : 0-99
	Min Temperature	Uint8_t	Minimum temperature : (-20) - 99

### 3.3 Modify data uplink frequency

Frame structure	Value	Type	Description
Object type	0x12	Uint8_t	
Data	Uplink cycle	Uint16_t	0-1500min

### 3.4 Update time request command

Frame structure	Value	Type	Description
Object structure	0x13	Uint8_t	
Data	NULL	NULL	

### 3.5 Change duty cycle

Frame structure	Value	Type	Description
Object type	0x14	Uint8_t	
Data	Duty cycle	Uint8_t	15,30,45,60s

### 3.6 Temporary release of device alarm

Frame structure	Value	Type	Description
Object Type	0x15	Uint8_t	
Data	NULL	NULL	The platform can temporarily release the alarm , 30min