TAG11_LoRa data protocol v1.0

Version update information

NO.	Revision	Modify the content	Modified date
1	V1.0	Initial version	2022/03/17

1.tag send regular data format

Start symbol + ID + state + battery voltage + voltage value + current value + switch value + checksum + RTC time

start character: 0x61;

ID: local ID, 4 bytes;

status: 1 byte,

bit7: voltage status, 1-undervoltage, 0-normal voltage;

bit6: voltage and current status, 1-exceed the set high and low temperature threshold, 0-normal;

bit5: button press flag;

bit4: Gateway response flag is required, set by command 009;

bit3: Whether there is an RTC time flag;

bit2: whether it is the first packet data flag;

bit1: switch state change flag;

bit0: reserved;

Battery voltage: 1 byte, unit 10mv, this value = actual value -150

    Such as: 0xce means 3.56v

Voltage value: 2 bytes, unit mv, high order first,

Current value: 2 bytes, unit uA, high order first,

Switch value: 1 byte, 00H-on, 01H-off

Checksum: 1 byte, the cumulative sum of all previous data;

RTC time: 6byte, the format is year+month+day+hour+minute+second, set by command 009;

2. Gateway downstream command format: header+tagID+downstream command+command content+CHECKSUM

Header: 0xF0;

tagID: 4byte;

Downlink command: 1 byte;

Command content: n bytes;

CHECKSUM: cumulative sum of all previous data;

The specific format is shown in the following table. Unless otherwise specified, the following table is in hex format, MSB First,

command	Function	Downstream command format	Instruction description
01	Low voltage alarming function	F0 ID 01 A X Y CHECKSUM	A: 0x00, disable this function 0x01, enable this function X: Low voltage threshold value, [2000-3600], unit: 1mV, 2byte; Y: The interval time for reporting the number of door openings after low voltage, [1-1440], unit min, 2byte;
02	Set heartbeat packet interval	F0 ID 02 X CHECKSUM	X:[1-1440],unit:min，2byte,
03	Set high/low	F0 ID 03 A X Y M N Z	A:0 disable this function (default)

	voltage/current alarming function	CHECKSUM	1 enable this function X: High voltage threshold value, [0,10000], unit: mv, 2byte, X: Low voltage threshold value, [0,10000], unit: mv, 2byte, M: High current threshold value, [0,20000], unit: uA, 2byte, N: Low current threshold value, [0,20000], unit: uA, Z: interval time of sending data after alarm, [1-1440], unit min, 2byte
04	Set transmit power	F0 ID 04 X CHECKSUM	X:Power value，[0,15],1byte； 15=20dbm; 14=19dbm; 13=18dbm; 12=17dbm; 11=16dbm; 10=15dbm; 9=14dbm; 8=13dbm; 7=12dbm; 6=11dbm; 5=10dbm; 4=9dbm; 3=8dbm; 2=7dbm; 1=6dbm; 0=5dbm; This command must be executed after receiving the restart module command (255) from the gateway
05	Set sensor frequency	F0 ID 05 X CHECKSUM	X: frequency band value, 1byte; X=0 433MHz; X=1 868MHz X=2 470MHz X=3 915MHz

			This command must be executed after receiving the restart module command (255) from the gateway
06	Set the RTC time	F0 ID 06 Year Mounth Day Hour Minute Second CHECKSUM	
07	Set the maximum data sending delay time	F0 ID 07 X CHECKSUM	X: delay time, [0,300], unit: second, 2byte
08	Set the time interval for reading voltage/current/switch	F0 ID 08 X CHECKSUM	X:[0,1440], unit: min, 2byte
09	Extend setting	F0 ID 09 A B C D E F G H CHECKSUM	A=0, turn off the ACK function; A=1, the ACK function is enabled, it must be used in conjunction with the gateway; B=0, the sent data does not include RTC time; B=1, the sent data includes RTC time, it is recommended to enable this function when ACK is turned on; C=0; D=0; E=0; F=0;
21	Set the Channel	F0 ID 15 X CHECKSUM	X: channel value, [0,100], 1byte This command must be executed after receiving the restart module command (255) from the gateway
35	Set work mode	F0 ID 23 X CHECKSUM	X=0, shutdown mode; X=1, boot mode
36	Set buzzer beep time	F0 ID 24 X CHECKSUM	X: tweet time, unit s, [0,65535], 2byte, 0 means the buzzer does not work; 65535 means the buzzer works until the voltage and current return to normal
37	Turn off the buzzer	F0 ID 25 00 CHECKSUM	
40	Set the sending protocol	F0 ID 28 X CHECKSUM	
42	Set the voltage and current calibration value	F0 ID 2A X Y Z CHECKSUM	X: 0, close calibration; X:1, enable calibration;

			Y: voltage calibration value, 2 bytes, unit: mv, Bit15=0 means voltage plus calibration value Bit15=1 means voltage minus calibration value Z: current calibration value, 2 bytes, unit: mv, Bit15=0 means current plus calibration value Bit15=1 means current minus calibration value
253	Set the voltage and Search single command	F0 ID FD X CHECKSUM	X:command to query,1byte
254	regular response	F0 ID FE CHECKSUM	ID:correspond tag ID; CHECKSUM:cumulative sum
255	restart the module	F0 ID FF 00 CHECKSUM	

5. Reply gateway downlink command format: header+ID+downlink command+execution result+CHECKSUM

Packge header: 0x30;

Downlink command: the gateway's downlink command value;

Results of the:

If it is a setting command, it is 1 byte, 0x00 indicates that the setting is successful, 0x05 indicates that there is no such command, and 0x08 indicates that the parameter is incorrect;

If it is a query command, it is the query command + query result + the content of the command;

The query result is 1 byte, 0x00 indicates that the query is successful, 0x05 indicates that there is no such instruction, and 0x08 indicates that it failed;

Content of the command: If the query result is 0x05 or 0x08, there is no such data