

Lora gateway Transparent Transmission Protocol

I . Upstream Packet Protocol

Start character (1byte) + packet length (2byte) + type (1byte) +IMEI (8byte) + data area (X1) + serial number (2byte) +CRC16 check character (2byte)

- 1、 Start character: A0
- 2、 Packet length: the length of all following data
- 3、 Type:

type	explanation
0x00	Gateway device information
0x01	heartbeat packet
0x02	application data
0x03	Application data (encrypted)
0x04	Reply to gateway downlink commands
0x05	Reply to TAG downlink command
0x06	Gateway version information

- 4、 Data area:

Gateway device information:

Hardware type (2byte) + Firmware version (4byte) + RTC date time(6byte) + state data length (2byte) + Alarm type (1byte) + Terminal information(1byte) + network signal strength(1byte) +network status(1byte) +battery voltage(2byte)+External voltage (2byte) +reserved extension bits

Hardware type:

type	series	Numbering	name
RD07_2G	4	13	040DH
RD07_4G	4	14	040EH
RD07_WIFI	4	15	040FH

Firmware version: For example, 01H 06H 00H 00H means Firmware version is 1.06

RTC date time: The RTC time of this piece of data is packaged and ready to be sent, and each byte sequentially represents the year, month, day, hour, minute, and second.

state data length: 0 means there is no such data

Alarm type: AAH regular data, 10H- low voltage alarm data, 60H- external power plug-in alarm data, 61H- external power unplugged alarm data

Terminal information: Indicates the status of the terminal device, expressed in one byte, bit6=1 data ends, = 0 data has not ended, the serial number should be consistent

bit	7	6	5	4	3	2	1	0
meaning	Whether to connect the power	No definition yet	No definition yet	No definition yet	No definition yet	No definition yet	No definition yet	No definition yet

network signal strength: hex Format

network status: 1=Yes, 0=No of the following

bit	7	6	5	4	3	2	1	0
meaning	No definition yet	No definition yet	Whether the TCP connection is established	Whether to register to GPRS network	whether to roam	Whether to register to the GSM network	Whether the SIM card is detected	Whether to open the module

battery voltage: unit: 10mv,MSB first

External voltage: unit: 10mv,MSB first

Heartbeat packet: RTC (4byte)

RTC date time: The RTC time of this piece of data is packaged and ready to be sent, and each byte sequentially represents the year, month, day, hour, minute, and second.

Application data package: RSSI (1byte) + tag data (see protocol document)

RSSI: The tag RSSI value measured by the gateway, unit:-dbm;

Tag data: Different tags have different data, see related tag protocol documents for details;

The following are the various tag data:

Single temperature version: start symbol + tag ID + status + battery voltage + temperature + checksum + end symbol + RTC time

Temperature and humidity version: start symbol + tag ID + status + battery voltage + temperature + humidity + checksum + end symbol + RTC time

Humidity unit: 0.1% temperature and humidity version: start symbol + tag ID + status + battery

voltage + temperature + humidity + checksum + end symbol + RTC time
 Tag11: start symbol+tag ID+state+battery voltage+voltage value+current value+switch value+checksum+RTC time

Reply to the gateway downlink command: downlink type (1byte) + downlink command (2byte) + result (1byte) + command value (X)

Downstream type: 00H means set command, 01H means read command;

Downlink command: command value;

Result: Set or read the command result, occupying 1 byte, 00H indicates success, 05H indicates that the command is not supported, and 08H indicates failure;

Command value: If it is set, there is no such data. If it is a read command, it is the command set value. The data of this block is ASCII code format, and the different data contents of the command are separated by a number. See the command table for details. This data is 1,t-gateway.tzonedigital.cn,54929

Reply to tagDownlink command: start character (1byte)+tag ID (4byte)+Downlink command (1byte)+execution result (X)+check (1byte)

Start character: 30H

TAG ID:

Downlink command: If it is FDH, it is a read command, and other values are set commands.

Execution result: 1 byte if it is a setting command, 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 means the query is successful, 0x05 means there is no such command, and 0x08 means failure.

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

Check: the checksum of the previous data.

Gateway version information: Hardware type (2byte) + Firmware version (4byte) + RTC date time (6byte) + module version length (2byte) + module version (X)

Hardware type:

type	series	Numbering	name
RD07_2G	4	13	040DH
RD07_4G	4	14	040EH
RD07_WIFI	4	15	040FH

Firmware version: For example, 01H 06H 00H 00H means Firmware version is 1.06.

RTC date time: The RTC time of this piece of data is packaged and ready to be sent. Each byte sequentially represents the year, month, day, hour, minute, and second.

Module version length: 2 bytes, if it is 00K 00H, it means that there is no such data.

Module version: ASCII code Format.

5. Check character: CRC16 (2bytes), start character (included) to the data before check character.

II . Downstream data packet protocol

start character (@) + type + separator (,) + data area + fixed terminator (#) + carriage return and line feed (\r\n)

1. The current UTC time of the downlink server: @UTC, 2019-01-10 09:52:01#
2. Reply ACK: @ACK, serial number#

After a connection is established between the device and the server, each time the machine sends a piece of data to the server, the server must reply with an ACK message to the machine, otherwise the machine will continue to send duplicate data.

Reply ACK Format: @ACK, Packet index (Hex converted into decimal)#

For example: @ACK,0035#

3. Downstream error: @ERROR, Numbering#
4. Downlink gateway command: @CMD, Command#; Command is the gateway command, ASCIIFormat, see the gateway command table for details;
5. Downlink tag command: @TAG, Command#;
Where len is the length of Command, ASCIIFormat;
Command is the tag command ASCIIFormat, see the gateway Downlink commandFormat of the tag document for details;
6. Query the gateway version: @Info#