DF200 Level Sensor

Protocol_LoRaWAN

V1.1

Date:2020-07-23

Changes

V1.1 Add down instructions

V1.0 Initial version;

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1 Special Notes

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2 Overview

DF200_LoRaWAN sensor uses the LoRaWAN transmission protocol. This document defines its uplink data format protocol and downlink format.

3 Terminal Upload Data Format

Field	Packet head	Forced bit	Device type	Report data type	Packet size	Payload	Reserved	Packet tail
Instruction	Packet head	Forced bit	Device type	Active reporting or answering	Packet length	Data content	Reserved	Packet tail
Size	1byte	1byte	1byte	1byte	1byte	0-255byte	1byte	1byte

3.1 Field Definition

3.1.1 Packet Header

Packet head:0x80； length:1byte.

3.1.2 Forced Bit

Forced bit:0x00; length:1byte

3.1.3 Device Type

Command	Device type
0X01	DF200

3.1.4 Report Data Type

Command	Type
0x01	Active reporting of information
0x02	Heartbeat data type
0X03	Reply to the downlink command
0X04	Re-transmit data type(not used)

3.1.5 Packet Size

The size of the packet,in hex.

3.1.6 Payload

Report data type0x01, 0x02 and 0x04:

S/N	1	2	3	4	5	6
Payload	Battery voltage	Power status	TEMP	Level percentage	Level status	Frame count
Size	2bytes	1byte	1byte	1byte	1byte	2bytes

Payload field definition:

1 **Battery voltage:**2bytes in hex; unit:mV;For example:0167 is converted to decimal system as 359, which means the voltage is 359*10mV=3.59V

2 **Power status:**1 byte, indicating the power status; 00 indicates normal, 01 indicates alarm;

3 **TEMP**:temperature; 1byte,in hex; For example, 0x10 meas 16℃;

4 **Level percentage:** 1 byte,in hex, indicating the liquid level percentage, which can only be the following values, 0%, 25%, 50%, 75%, 100%;

5 **Level status :** 1 byte, indicating the liquid level status; 00 means normal, 01 means alarm

6 **Frame count**: 2byte;

Report data type0x03:

S/N	1	2	3	4	5
Payload	Software version	Upload time	Detection time	Battery alarm threshold	Level alarm threshold
Size	2bytes	1byte	1byte	1byte	1byte

Payload field definition:

1 **Software version**:2bytes in hex;

2 **Upload time**: 1byte,in hex;

3 **Detection time**:1byte,in hex;
4 **Battery alarm threshold**:1byte,in hex;
5 **Level alarm threshold**:1byte,in hex;

3.1.7 Reserved Filed

Reserved filed: 0x00,1byte

3.1.8 Packet Tail

Packet tail: 0x81,1byte

3.2 Example

For example1: Active reporting of information. Data type 0x01
800001010F024C00194B0000010081
80: Frame header
00: Reserved, default 00
01: Device type, DF200
01: Active reporting of information
0F： Frame size, 15bytes
024C: battery voltage, representing 5.88V
00: means the battery voltage is normal
19: Temperature, representing 25°C
4B: Level percentage, which represents 75% of the liquid in the container
00: the liquid level is normal
0001: Frame count, this is the second piece data
00: Reserved, default 00
81: Frame tail
For example2:Download confirmed information. Data type 0x03
800001030D0102180A14190081
80: Frame header
00: Reserved, default 00
01: Device type, DF200
03: Download confirmed information
0D: Frame size, 13bytes
0102:Software version,means V1.02
18: cycle upload interval, 24h
0A: cycle detection interval, 10 min
14: Battery alarm threshold,means 20%
19: Level alarm threshold,means 25%
00: Reserved, default 00
81: Frame tail

4 Terminal Downlink Commands Format

If you send commands through the serial port to configure terminal parameters, you can send them directly in ASCII format.

Direction: Command format from computer to terminal (DF200).

Format:

Field	Packet head	Command type	Payload			Packet tail
Instruction	Packet head	The function of commands	Header	Command code	Content	Packet tail
Size	1byte	1byte	2byte	1byte	n	1byte

Packet Head

Packet head:0x80; 1byte.

Commands Type

Commands type	Description
0x02	Configure device parameters through the downlink
0x05	error
...	...

Payload

Header：9999

Command code：1byte

Command code

Command code	Function
0x01	Setting cycle upload time interval
0x02	Setting level alarm threshold
0x05	Setting battery alarm value
0x08	Setting the cycle detect time
0x09	Switch function setting

Packet Tail:

Packet tail:0x81;1byte.

4.1 0x01 Setting cycle upload time interval

Function: Set data cycle upload time interval;

Default: 24h

Modifiable range: 1-168 hours

Command sending type: sent in ASCII, from computer to terminal.

Format:

Field	Packet head	Command type	Payload			Packet tail
Instruction	80	02	9999	01	Content	81
Size	1byte	1byte	2byte	1byte	1byte	1byte

Content: 1 byte, expressed in hexadecimal. Unit: hour. Value range: 1-168.

Example 1: Set the periodic reporting interval to 10 hours,

Command：80029999010A81

4.2 0x02 Setting level alarm threshold

Function:Setting level alarm threshold

Default: 25%

Modifiable range 1%-99%

Command sending type: sent in ASCII, from computer to terminal.

Format:

Field	Packet head	Command type	Payload			Packet tail
Instruction	80	02	9999	02	Content	81
Size	1byte	1byte	2byte	1byte	1byte	1byte

Content: 1 byte, expressed in hexadecimal. unit:%. Value range: 1% -99%.But the effective value is only 25%, 50%, 75%, 100%.

Example 1: Set level alarm threshold to 50%,If the liquid level is below 50%, an alarm will be issued.

Command：80029999053281

4.3 0x05 Setting battery alarm value

Function:Setting battery alarm value

Default: 20%

Modifiable range 5%-99%

Command sending type: sent in ASCII, from computer to terminal.

Format:

Field	Packet head	Command type	Payload			Packet tail
Instruction	80	02	9999	05	Content	81
Size	1byte	1byte	2byte	1byte	1byte	1byte

Content: 1 byte, expressed in hexadecimal. unit:%. Value range: 5% -99%.

Example 1: Set the low battery alarm threshold to 20%,

Command：80029999051481

4.4 0x08 Setting the cycle detect time

Function: Setting the cycle detect time

Default: 10min

Modifiable range: 1-60min

Command sending type: sent in ASCII, from computer to terminal.

Format:

Field	Packet head	Command type	Payload			Packet tail
Instruction	80	02	9999	08	Content	81
Size	1byte	1byte	2byte	1byte	1byte	1byte

Content: 1 byte, expressed in hexadecimal. Unit: minute. Value range: 1-60.

Example 1: Set the cycle detect time to 20min,

Command：80029999081481

4.5 0x09 Switch function setting

Function：Switch function setting

Command sending type: sent in hexadecimal, from server to terminal.

Format：

Field	Packet head	Command type	Payload			Packet tail
Instruction	80	02	9999	09	Content	81
Size	1byte	1byte	2byte	1byte	1byte	1byte

0B/0C：Turn on/off echo

0D: Restore the factory default parameter configuration.

00: Empty calibration, set the current level to 0%

01: Full calibration, set the current liquid level to 100%

Example1:Turn on echo

Command：8002999909 0B81

Example2:Set door status is alarm status.

Command：8002999 90A0F81